Energy and Environmental Performance of
Biomass-Fired Heating Equipment
Program Opportunity Notice (PON) 3027
$7.0 Million Available

Proposals Due: January 13th, 2015 by 5:00 PM E.T.*

The New York State Energy Research and Development Authority (NYSERDA) announces the availability of funding to support research and development efforts toward a high-efficiency and low-emissions biomass thermal industry in New York State (NYS) through Renewable Heat New York. Eligible projects under this PON are described in the nine (9) categories (A through I) below:

PON Categories		Available Funds	Per Project Cap
A.	Product Development and Evaluation of High-Efficiency Biomass-Fired Boilers, Furnaces, Stoves, Thermal Storage, Emission Control Technologies, Sensors, Controls and Other Non-Fuel Components for Residential or Commercial Applications	$1,000,000	$350,000
B.	Product Development and Evaluation of Bulk Residential Wood Pellet Storage, including Monitoring of Indoor and Outdoor Storage Containers, Ventilation and Controls to Prevent Carbon Monoxide Exposure within the Home	$500,000	$250,000
C.	Automation and System Packaging of High-Efficiency Biomass Heating System Technologies and Components that will Produce Manufacturing Efficiencies and Significantly Reduce Product Costs for the Consumer	$1,000,000	$350,000
D.	Comprehensive Test Method Development for Energy and Emissions Performance Characterization of Biomass Heating Technologies and/or Systems	$1,000,000	$500,000
E.	Technology Demonstration and Evaluation of High-Efficiency Biomass-Fired Systems and Emission Control Technologies	$600,000	$350,000
F.	Innovations in Biomass Fuel Processing for Low Moisture Wood Chips and Low Ash Non-Woody Pellets	$750,000	$250,000
G.	Biomass Fuel and Feedstock Quality Analysis and Improvement, Evaluation of Elemental Composition of Wood Chips and Regional Consensus Building Towards Enforceable and Practical Feedstock and Fuel Quality Standards	$350,000	$175,000
H.	Emission Characterization, Ambient Air Quality, Indoor Air Quality, Exposure, Health effects and Health and Safety Studies of Biomass Emissions Due to Operation of Biomass Heating Systems or Fuel Storage	$1,500,000	$350,000
I.	College Teams and Competitions for Advancing Wood Stove and Pellet Stove Design and Innovation	$300,000	$75,000
Total:		$7,000,000	

A total of $7,000,000 is available for projects. If funds from any of the categories are not exhausted, NYSERDA reserves the right to allocate the remaining funds to another category. The available funds may not be sufficient to finance all proposals. Cost-sharing with respect to the total project cost by proposers of at least 25% is preferred for non-product or non-proprietary process development efforts (Categories C, D, E, F, G and H). Product or process development (Categories A, B and possibly F) efforts must be cost-shared at a minimum of 50% and any product development projects greater than $50,000 may be subject to recoupment. See Section VIII, General Conditions. Modest to moderate cost-sharing is preferred, but not required for Category I.

Proposal Submission: Proposers must submit one electronic copy and ten(10) complete paper copies of the proposal with a completed and signed Proposal Checklist attached to the front of the proposals, one (1) of which must be an original signature. Proposals must be **received by NYSERDA** by 5:00 PM Eastern Standard Time (EST) on January 13, 2015.

Proposals must be clearly labeled and submitted to:

Roseanne Viscusi, PON 3027
NYS Energy Research and Development Authority
17 Columbia Circle
Albany, NY 12203-6399

Technical questions regarding this PON should be directed to Ellen Burkhard (518) 862-1090 ext. 3332 email Ellen.Burkhard@nyserda.ny.gov or Joseph Borowiec (518) 862-1090 ext. 3381 email Joseph.Borowiec@nyserda.ny.gov. For contractual questions, contact Nancy Marucci at (518) 862-1090 ext. 3335 email Nancy.Marucci@nyserda.ny.gov.

No communication intended to influence this procurement is permitted except by contacting Ellen Burkhard or Joseph Borowiec (Designated Contacts). Contacting anyone other than the Designated Contacts (either directly by the proposer or indirectly through a lobbyist or other person acting on the proposer's behalf) in an attempt to influence the procurement: (1) may result in a proposer being deemed a non-responsible offerer, and (2) may result in the proposer not being awarded a contract.

*Late proposals will be returned. Incomplete proposals may be subject to disqualification. It is the proposer's responsibility to ensure that all pages have been included in the proposal. Faxed or e-mailed proposals will not be accepted. Proposals will not be accepted at any other NYSERDA location other than the address above. If changes are made to this solicitation, notification will be posted on NYSERDA's web site at www.nyserda.ny.gov.

I. Introduction:

Interest in biomass thermal combustion continues to increase in New York State (NYS) with the introduction of Renewable Heat New York. Consumers are motivated to install biomass heating systems by a variety of reasons, including lower energy costs and reduced fossil fuel use. The overarching objective of Renewable Heat New York is to assist the high-efficiency, low-emissions biomass heating sector achieve scale.

Research has shown that the thermal efficiencies of biomass heating systems can range from less than 25% to greater than 85%. Fine particulate matter ($PM_{2.5}$) and carbon monoxide (CO) emissions can range from moderate to extremely high, creating concern for public health in general, and creating special concern for susceptible populations such as children, the elderly and those with asthma or cardiovascular disease. The attainable efficiencies can be comparable to those of fossil fuel-fired systems but the $PM_{2.5}$ and CO emissions from biomass-fired systems are orders of magnitude higher, even for the best performing systems. Performance is highly dependent on the equipment design, installation, fuel quality and operation, among other factors, and there is an opportunity to optimize each of these to promote high performance.

This PON seeks proposals that support the development and advancement of a high-efficiency, low-emissions biomass thermal industry in NYS. Proposals targeting any of the following categories will be considered. Section II contains more details for each category.

PON Categories		Available Funds	Per Project Cap
A.	Product Development and Evaluation of High-Efficiency Biomass-Fired Boilers, Furnaces, Stoves, Thermal Storage, Emission Control Technologies, Sensors, Controls and Other Non-Fuel Components for Residential or Commercial Applications	$1,000,000	$350,000
B.	Product Development and Evaluation of Bulk Residential Wood Pellet Storage, including Monitoring of Indoor and Outdoor Storage Containers, Ventilation and Controls to Prevent Carbon Monoxide Exposure within the Home	$500,000	$250,000
C.	Automation and System Packaging of High-Efficiency Biomass Heating System Technologies and Components that will Produce Manufacturing Efficiencies and Significantly Reduce Product Costs for the Consumer	$1,000,000	$350,000
D.	Comprehensive Test Method Development for Energy and Emissions Performance Characterization of Biomass Heating Technologies and/or Systems	$1,000,000	$500,000
E.	Technology Demonstration and Evaluation of High-Efficiency Biomass-Fired Systems and Emission Control Technologies	$600,000	$350,000
F.	Innovations in Biomass Fuel Processing for Low Moisture Wood Chips and Low Ash Non-Woody Pellets	$750,000	$250,000
G.	Biomass Fuel and Feedstock Quality Analysis and Improvement, Evaluation of Elemental Composition of Wood Chips and Regional Consensus Building Towards Enforceable and Practical Feedstock and Fuel Quality Standards	$350,000	$175,000
H.	Emission Characterization, Ambient Air Quality, Indoor Air Quality, Exposure, Health effects and Health and Safety Studies of Biomass Emissions Due to Operation of Biomass Heating Systems or Fuel Storage	$1,500,000	$350,000
I.	College Teams and Competitions for Advancing Wood Stove and Pellet Stove Design and Innovation	$300,000	$75,000
Total:		$7,000,000	

Proposals will be considered responsive to this PON only if they address one (1) of the targeted categories. Proposers must clearly indicate the category to which they are applying. Proposers desiring to address more than one category should submit separate proposals. When appropriate, selected proposers may be asked to work with a Project Advisory Committee.

II. Program Requirements – Targeted Categories:

A. Product Development and Evaluation of High-Efficiency Biomass-Fired Boilers, Furnaces, Stoves, Thermal Storage, Emission Control Technologies, Sensors, Controls and Other Non-Fuel Components for Residential or Commercial Applications

There is a need for innovation toward higher-efficiency, lower-emissions biomass heating technologies including boilers, furnaces and stoves. For example, low thermal mass wood boilers that have staged combustion and sensors to optimize combustion performance are capable of greatly improved performance compared to conventional technologies. Examples of innovative strategies are oxygen and temperature sensors and variable primary and secondary air controls. Automation of wood or pellet stoves, boilers and furnaces for combustion and thermal efficiency optimization is also needed.

Product development of biomass-fired boilers, furnaces, stoves, pellet stoves, thermal storage, emission control technologies (ECT), sensors, controls, and other components for residential or commercial applications are eligible in this category.

Projects focused on the product development and evaluation of comprehensive energy management controls for heating system integration will be considered and should include the biomass boiler(s), thermal storage, ECT, existing fossil fuel-fired heating boiler and energy management systems.

Projects developing non-woody biomass heating technology are eligible but must optimize the heater for grass or other biomass feedstocks relevant to NYS.

All heating technology projects must include laboratory or field evaluation of the product being developed by a qualified third-party with demonstrated expertise in efficiency and emissions performance testing. The boiler, stove or furnace product evaluation must include measurement of thermal efficiency, $PM_{2.5}$ and CO emissions for the entire burn cycle, and isolation of emissions from the start-up, high-burn and end phases over a wide range of heater output loads experienced when in-use. Considerations should be made for part load, the use of thermal storage, as well as diurnal and annual load variation representative of NYS. For residential cordwood boilers, the Brookhaven National Laboratory Partial Thermal Storage Test (BNL-PTS test or http://www.dec.ny.gov/chemical/89328.html) should be used. For residential pellet boiler evaluations, a modification of the BNL-PTS test may be proposed. For commercial boilers, the BNL-PTS test, ASHRAE 155-p or another proposed method may be used but it must be a comprehensive full-duty cycle test as described above. Proposals may include laboratory equipment as an eligible expense.

ECT development and or evaluations are also encouraged that improve biomass heating for applications at schools, hospitals or locations with sensitive populations or locations with existing health-relevant air quality impacts. For ECT development and evaluation projects, both energy benefits and penalties must be quantified. Emissions measurements expected to be included are $PM_{2.5}$, elemental carbon, organic carbon, speciated organics (polycyclic aromatic hydrocarbons and other molecular markers), trace metals, inorganic ions, sulfur dioxide, CO, carbon dioxide, nitrogen oxide (NO_x) and volatile organic compounds. Particle characterization (size, number, morphology) may also be included.

Product development activities must include a path to commercialization with a timeline and the development of a strong business plan for the technology. Projects focused on laboratory or field evaluation only are preferred to be cost-shared at 25%. Projects including product development must be cost-shared at a minimum of 50% and may be subject to recoupment if greater than $50,000. See Section VIII, General Conditions.

B. Product Development and Evaluation of Bulk Residential Wood Pellet Storage, including Monitoring of Indoor and Outdoor Storage Containers, Ventilation and Controls to Prevent Carbon Monoxide Exposure within the Home

Wood pellets stored in bulk can produce CO. Fatalities due to CO exposure have been reported in large storage facilities in Europe and aboard ships transporting pellets from North America to Europe (Gauthier *et al.*, 2012). The off-gassing chemical mechanism(s) of the various oxidative processes giving rise to the observed CO concentrations are not yet fully understood. Safe options for residential wood pellet storage are sought under this category. Alternative processes to reduce CO off-gassing from pellets will also be considered but must also include a laboratory evaluation component by a qualified third-party. Laboratory evaluations must include a wide range of pressure, temperature and moisture conditions experienced in homes in NYS. Multidisciplinary partnerships including team members from engineering, chemical, building, indoor air quality, and health sciences are encouraged. Eligible projects in this category include those listed below.

- Product development projects for indoor or outdoor pellet storage, and ventilation and controls solutions to prevent release of CO within the dwelling. For all product development projects, laboratory evaluation by a third-party with chemistry, building science, and indoor air quality expertise is required.
- Evaluation of commercially available residential bulk wood pellet storage container products (including those manufactured in NYS or imported) and bagged pellets (also including those manufactured in NYS or imported) for CO emissions. The proposal must be submitted by a qualified third-party with chemistry, building science and indoor air quality expertise to perform the evaluation.
- Development of cost-effective processes prior to pellet delivery to reduce CO off-gassing post-delivery. For all process development projects, laboratory evaluation by a third-party with appropriate expertise in chemistry, building science and indoor air quality is required.

Product development activities must include a path to commercialization with a timeline and the development of a strong business plan for the technology.

Projects focused on laboratory evaluation are preferred to be cost-shared at 25%. Projects including product or process development must be cost-shared at a minimum of 50% and may be subject to recoupment if greater than $50,000. See Section VIII, General Conditions.

C. Automation and System Packaging of High-Efficiency Biomass Heating System Technologies and Components that will Produce Manufacturing Efficiencies and Significantly Reduce Product Costs for the Consumer

This category seeks proposals that develop a new manufacturing process for a high-efficiency and low-emissions biomass heating system technology and/or component(s), or demonstrate improvement in an existing manufacturing process for components and/or systems. Automation projects must result in a functioning manufacturing process located within NYS for a high-efficiency, low-emissions biomass heating technology. If the project is an improvement to an existing manufacturing process then the project must result in a net decrease of the market price for the consumer of the high-efficiency, low-emissions biomass heating system component. System integration such as containerization of boilers, plug-and play preassembly for ease of installation in the field, or other packaging efforts are also eligible topics and must result in a decrease of the installed price to the consumer of the high-efficiency, low-emissions biomass heating technology or system component, or expand the potential market for high-efficiency biomass heating systems.

Automation and system packaging projects must be cost-shared at a minimum of 50%. Recoupment is not required.

D. Comprehensive Test Method Development for Energy and Emissions Performance Characterization of Biomass Heating Technologies and/or Systems

Residential and small commercial biomass heating systems (< 300,000 Btu/h):

Recent advances in testing of biomass heating systems have been demonstrated through the development of the Brookhaven National Laboratory test of advanced cordwood boilers with Partial Thermal Storage (BNL-PTS test). This test method captures the entire burn cycle including start-up, steady-state, and end phase of the burn and is more representative of in-use conditions than conventional regulatory testing.

There continues to be a need for:

- Testing of biomass heating technologies for energy and emissions performance on conventional and new test methods comparing various fuels including pellets, chips, bricks, cordwood and cribwood.
- Development of affordable energy and emissions performance test methods that replicate in-use conditions throughout the entire burn cycle for innovative designs of cordwood or wood pellet boilers, stoves and furnaces.
- Development of test methods to support an evaluation and rating mechanism similar to Energy Star but designed for residential and small commercial biomass heating systems to more accurately distinguish the expected in-use efficiency and emissions performance of appliances that could be used to inform consumers.
- Adaptation of test methods for laboratory or installed (field) conditions.
- Repeated testing of wood heaters in one laboratory by the same method and round-robin testing at multiple laboratories to determine variability within and among test methods and labs.

Large commercial biomass heating systems:

There is a need for further development of performance testing for large commercial biomass heating systems (300,000 Btu/h and larger).

Comprehensive laboratory- and/or field-based test method development proposals are sought in this category. Proposed work must include measurement of the thermal efficiency, $PM_{2.5}$ emissions and CO emissions for the entire burn cycle, as well as isolation of emissions from the start-up, high-burn and end phases over a wide range of boiler output loads experienced when in-use. Proposals may also include adaptation of test methods designed for commercial boilers using other fuels to the specific needs of commercial biomass boilers. Proposed work must include either a field measurement component for method development/validation on a boiler previously installed at a facility, or accommodations must be made for laboratory testing. Work must include measurements under part-load to values below 15%, idle losses, and performance with and without thermal storage, as well as diurnal and annual load variations representative of those experienced in NYS.

Evaluation of portable monitors:

Evaluation and demonstration of commercially available portable monitors capable of small appliance stack measurements for efficiency, CO and $PM_{2.5}$ under field conditions with a simplified test cycle will also be considered.

Projects focused on laboratory and field evaluation projects are preferred to be cost-shared at 25%.

E. Technology Demonstration and Evaluation of High-Efficiency Biomass-Fired Systems and Emission Control Technologies

This category seeks proposals for demonstrations and evaluations of fully-automatic, high-efficiency wood pellet-fired heating systems for technologies or system configurations not previously evaluated by NYSERDA. Of special interest are high-efficiency pellet-fired boilers in steam heating systems, boiler or energy management control systems for improved commercial pellet-heating systems integration, and innovative residential pellet stoves. Multidisciplinary partnerships are encouraged and could include host sites, boiler, system controls or stove designers and manufacturers, researchers, energy engineering professionals, academia and others to showcase technologies. Detailed reporting, presentations and publication(s) will be required.

Wood pellet-fired heating system demonstration projects must use high-efficiency, low-emission pellet technologies. If awarded, the heating system design will be required to include proper sizing (typically $\leq$ 60% of design-load or tandem boiler systems for commercial applications) and energy management for optimizing energy efficiency in the entire system under all load conditions expected during the heating season. Integration of the biomass heating system with the existing heating system (boilers, energy management system and other components) must be described. Proposals for commercial demonstrations must include intensive commissioning and continuous (15-minute integrated basis) measurement and verification monitoring of the heating system performance including efficiency for at least two (2) years. Boilers do not need to be evaluated for $PM_{2.5}$ emissions if third-party emissions testing has already been performed, but efficiency (higher heating value of the fuel) and emissions ($PM_{2.5}$ and CO in lb/MMBtu) test results must be clearly stated in the proposal.

Allowable project costs for commercial technology demonstrations include the heating system boiler(s), thermal storage, pellet storage, heat exchangers, pumps, flow meters and thermocouples, controls systems, system design, system installation, commissioning and measurement and verification services.

Demonstration projects for improved controls systems are encouraged to be retrofitted to an existing pellet boiler heating system to document system performance improvements.

Costs for extensive site work should be borne entirely by the proposer but may be used as cost-share.

For residential pellet stove technologies, performance measurements for thermal efficiency and emissions ($PM_{2.5}$ and CO) are required.

Projects that will have public visibility or otherwise include educational components, to assist in growing the high-efficiency and low-emissions pellet heating market, are preferred.

Demonstration and evaluation projects are preferred to be cost-shared at 25%.

F. Innovations in Biomass Fuel Processing for Low Moisture Wood Chips and Low Ash Non-Woody Pellets

Preferred projects are described below. Projects focused on other ways to innovate fuel processing for use in commercial biomass boilers will also be considered.

- Proposals focused on process development for low moisture content (less than 30% dry basis) wood chips are eligible. Commercial biomass boilers frequently burn wood chips rather than wood pellets due to the fuel cost savings. Staged-combustion biomass boilers, such as those made in NYS, can achieve high-efficiency performance when using low moisture content wood chips. Unfortunately, in NYS only green chips (greater than 40% moisture content) are readily and consistently available in high volumes. Having a reliable supply of low moisture content wood chips is a critical need for the biomass heating market to ensure advanced biomass heating systems maintain high performance.
- Proposals will be considered for processing and/or harvesting methods that produce low moisture content wood chips in an energy-efficient and cost-effective manner, and lead to near-term commercialization. Process demonstrations will be considered if they lead to low moisture wood chips and focus on applications at a wood harvest site to reduce transportation costs, a commercial heating demonstration or a wood pellet manufacturing facility. Proposals must include an economic evaluation to determine cost savings.
- Process development for producing low-ash content pellets from feedstocks relevant to NYS, including non-woody, high-bark or other non-traditional feedstocks such as native grasses or willow are eligible. For example, there is interest in using grasses as feedstock for biomass heating fuel but grass feedstocks can present significant challenges because of the high ash and chlorine content which results in poor combustion quality, operational issues, lower efficiencies, unacceptable emissions and/or corrosion of heating system materials. Proposals will be considered for harvesting or processing methods that produce a low ash and low chlorine content pellet, or solid heating fuel, in an energy-efficient and cost-effective manner. Fuels will be

required to undergo a rigorous analysis to measure and evaluate ash content and properties, energy content, moisture content, and elemental composition including organic material and inorganic ions. Proposals may include a laboratory evaluation of boiler performance to test the fuel but, if choosing to do so, proposers must partner with a boiler manufacturer that has designed the combustion chamber to be compatible with the appropriate fuel type. Proposals that include boiler performance testing must include a letter of commitment from the boiler manufacturer that indicates a willingness to make product improvements by optimizing compatibility and performance based on evaluation results.

Projects focused on laboratory or evaluation projects only are preferred to be cost-shared at 25%. Product development projects must be cost-shared at a minimum of 50% and may be subject to recoupment if greater than $50,000. See Section VIII, General Conditions.

G. Biomass Fuel and Feedstock Quality Analysis and Improvement, Evaluation of Elemental Composition of Wood Chips and Regional Consensus Building Towards Enforceable and Practical Feedstock and Fuel Quality Standards

Preferred projects are described below. Projects focused on other innovative ways to measure or certify the quality of solid biomass heating fuels will also be considered.

- Proposals will be considered for sampling and evaluation of wood chip properties and quality for wood species relevant to NYS. Projects will require rigorous analysis including ash content and properties, energy content, moisture content, and elemental composition including organic material and inorganic ions. Proposals performing a side-by-side comparison with wood pellets are encouraged. Projects exploring the source of potentially problematic results are encouraged. For example, do high levels of certain elements result from harvesting, handling and storage procedures, or are they a result of soil uptake? Do they differ across species?
- Proposals will be considered that promote activities designed to encourage regional consensus building across the Northeast on enforceable and practical fuel and feedstock standards for commercial, industrial and residential biomass heating, particularly for wood pellets. Work should include a description of different possible standards or certification schemes, routes to achieve them in NYS and pros and cons of various approaches, including the ENplus standard used in Europe. Because a certification scheme is likely to only be practical if there is a unified approach throughout the region, work should also include workshops and webinars to inform other officials in the Northeast of findings. Work must address what sort of infrastructure would be required, including certification, testing and inspection. An advisory group is recommended. It is recognized that there is no consensus on issues regarding how to account for carbon cycling in forests, and that varying harvesting practices can result in different greenhouse gas outcomes.

Projects are preferred to be cost-shared at 25%.

H. Emission Characterization, Ambient Air Quality, Indoor Air Quality, Exposure, Health effects and Health and Safety Studies of Biomass Emissions Due to Operation of Biomass Heating Systems or Fuel Storage

This category will allow for studies to evaluate ambient air pollution, indoor air quality (including mitigation techniques), environmental exposure, health effects, and health and safety studies for biomass heating, including fuel combustion and the storage of biomass fuels. Studies may include targeted environmental exposure assessments, risk assessments, epidemiological or toxicological studies, and/or health impact assessments relevant to NYS populations. Innovative heating system emissions characterization will also be considered (ex. particle composition, number or morphology). A symposium, "Wood Biomass for Heat and Power: Addressing Public Health Impacts" was held in 2011 and provides background on the state of technology and science and outlines many information needs for prioritizing public health while promoting wood biomass energy (http://www.sustainableproduction.org/downloads/WoodBiomassSymposium-Full-Final.pdf)

Teaming arrangements and leveraging of previously completed or on-going studies are encouraged. Preferred topics are described below but others will be considered if they meet the basic objectives of this category.

- Exposure assessment of CO off-gassing due to bulk storage of wood pellets
  Wood pellets stored in bulk produce CO but production rates may vary depending on the pellet composition, pellet age, storage conditions, and the reaction pathways involved. Studies focused on CO concentrations resulting from residential wood pellet storage and evaluating the resulting exposure potential are needed to develop guidance for residential pellet storage. Studies must address building conditions (including but not limited to air exchanges, temperature, humidity) experienced in homes during different times of the year. Studies must explore conditions for a range of housing stock representative of that found in NYS. It may be necessary to use environmental chambers or modeling techniques to simulate varying conditions. Multi-disciplinary teams, including: chemistry; engineering; indoor air quality; building science; exposure assessment; and health professionals are encouraged to apply for this priority topic.
- Indoor air quality
  Indoor air quality studies of wood smoke and components in residential or commercial buildings are eligible. Studies including mitigation techniques will be considered. Studies must use highly time-resolved measurements of PM, CO, and NOx.
- Ambient air quality
  Ambient air-quality studies of wood smoke and its components (PM, CO, molecular markers, particle number per volume of air) using fixed or mobile platforms focused on the spatial micro-scale are eligible. Efforts to assist communities reduce wood smoke hot spots are also eligible as an activity within an ambient air quality study and air quality benefits should be documented.
- Exposure and health effects due to indoor or outdoor wood smoke
  Environmental exposure assessments, risk assessments, epidemiological and/or toxicology studies, health effects, and/or health impact assessments for indoor or outdoor wood smoke and/or components relevant to NYS populations are also eligible. Locations with sensitive populations at schools, hospitals, or nursing homes are of special interest.
- Energy and emissions characterization
  Innovative energy and emissions characterization of biomass heating technologies and or emissions control technologies with a focus on particle characterization ($PM_{2.5}$, particle size, morphology, and chemical composition) are eligible if conducted within the context of Category H (alternatively, basic characterization studies should be proposed under Category A). Additional gaseous emissions, trace elements, molecular markers, organic carbon, or elemental carbon emitted from the stack or found in the bottom ash may also be important to measure.
- Health and safety of conventional and advanced biomass heating technologies
  A wide range of biomass heating technologies are now available in the market. Some technologies have only basic designs while others employ sophisticated sensors and controls. Flue gas CO concentrations can range from 25 to 40,000 ppm depending on the technology, phase of the burn, and fuel properties. An assessment of biomass heating technology CO emissions performance and comparison to existing health and safety guidelines or requirements for oil, propane, and natural gas technologies is needed.

Multi-disciplinary workshops on topics in this category will also be considered as standalone proposals or as a task within proposals. Projects are preferred to be cost-shared at 25%.

I. College Teams and Competitions for Advancing Wood Stove and Pellet Stove Design and Innovation

Woodsmoke from small appliances can be a large contributor to particulate emissions. Wood stove technology is undergoing important innovations as the US EPA and European countries tighten regulations on wood smoke emissions. Recent efforts such as the Woodstove Design Challenge have demonstrated that manufacturers and research groups at universities are incorporating important combustion optimization elements into stove design, including staged combustion to improve gasification, heavier refractories to maintain combustion chamber temperatures, and primary and secondary air sources combined with oxygen and temperature sensors and an on-board computer processing unit, which help maintain optimized combustion by controlling air-to-fuel ratios,

residence time, temperature, and turbulent mixing in the combustion chamber. (http://www.forgreenheat.org/stovedesign/announcement.html)

Proposals are invited from student teams located at colleges and universities within NYS to develop innovative cordwood stove or wood pellet stove prototypes. Stoves may be free-standing or fireplace inserts. Proposals may request $25,000 per year for up to 3 years. Funds may be requested for supplies needed to build a stove and determine its efficiency and emissions, including stove construction materials, laboratory equipment, or hand-held equipment such as gas analyzers and temperature probes. Funds may also be used for project-related travel expenses. Funds may not be requested for tuition. If funded, each institution will be required to participate annually in a one-day technology demonstration with other teams and will be asked to host the demonstration during one of the three years.

Cost –share is preferred but not required and any cost-share by the proposer should be identified.

III. Proposal Requirements – Categories A-H (For Category I please refer to Sections V and VI):

Proposers must submit one electronic and ten (10) paper copies of the completed proposal to the attention of Roseanne Viscusi at the address on the front of this Program Opportunity Notice/Request for Proposal. A completed and signed Proposal Checklist (Attachment A) must be attached as the front cover of your proposal, one of which must contain an original signature. **Late proposals will be returned and proposals lacking the appropriate completed and signed Proposal Checklist may be returned. Faxed or e-mailed copies will not be accepted.**

Proposals should follow the format below and provide sufficient and succinct information to complete the required descriptions and answer the questions described in the Proposal Evaluation criteria listed in Section IV. The preferred length of each proposal section is shown. **Proposals are subject to return without evaluation if more than 21 pages are submitted** (not including the Checklist Cover Sheet, Contract Pricing Proposal Forms (Attachment C), one-page letters of commitment, resumes, and attached energy audits executive summary or test result summary), or if a font smaller than 11 point is used. **Proposers may contact Ellen Burkhard at (518) 862-1090, ext. 3332 before preparing a proposal to discuss proposal requirements.**

Proposal Format

Proposals should not be excessively long or submitted in an elaborate format that includes expensive binders or graphics. Unnecessary attachments beyond those sufficient to present a complete, comprehensive, and effective response will not influence the evaluation of the proposal. Each page of the proposal should state the name of the proposer, PON **3027** and the page number.

Proposals must be in the following format and should address the questions below as may be applicable:

PART 1: Project Summary (Six (6) pages maximum)

Title & Principal Contact

A completed and signed Proposal Checklist, attached as part of this PON, with the project title and name, address, and telephone/fax number(s) of the principal contact person must be attached to the front of all copies of the proposal, one (1) of which must be an original signature. **Late proposals will be returned and proposals lacking the appropriate completed and signed Proposal Checklist may be returned.**(Not included in page count).

1. **Description of Proposed Project** (Three (3) pages maximum)
   - What is the title of the proposed project?
   - For which category (A-H) is the proposal being submitted? (select only one (1) category)
   - What specific energy or environmental issues would the project address?
   - What is the goal of the project?

- Briefly describe the technology aspect of the project, if applicable.
- Explain the scientific or engineering principles incorporated into the technology.
- For product development projects, describe the major development, commercialization, and business milestones necessary for near-term commercialization.
- How does the proposed work meet the requirements for its category?
- For technology demonstrations, state the energy efficiency and fine particulate ($PM_{2.5}$), carbon monoxide (CO), and nitrogen oxide (NO_x) emissions (lb/MMBTU $_{output}$) of the wood-fired heating system. Include reference to any recognized government certification or third-party verification test results. If EN-303 certification is cited, efficiency values must be given for the higher heating value of wood, $PM_{2.5}$ and CO in lb/MMBtu and ppm, respectively (this may be done in a cover letter and included as an attachment to the proposal application).

2. Value of the proposal in addressing objectives (One (1) page maximum)

- How would the proposed project achieve, enable, evaluate, or communicate the potential for, significant improvements in energy or environmental performance or consumer safety of biomass-fired heating equipment?
- If any component of the project will not be performed in NYS, explain why.
- How would consumers, businesses, and/or policy makers in NYS be able to use the project results?
- How would the project results be timely?
- What energy and environmental benefits would be achieved or informed in NYS?
- Approximately how many and what types of jobs might be created in NYS?
- For automation projects, how will the price for the consumer be changed?

3. Soundness of Project Methods (Two (2) pages maximum)

Describe the proposed project methods and overall research design. Briefly explain why the equipment, models, methods, and other aspects of the work are expected to be capable of meeting the project objectives. Describe the extent to which these have been accepted by policy making organizations, or otherwise demonstrated to be valid.

PART 2: Statement of Work (up to six (6) pages maximum)

1. Tasks

The Statement of Work is the primary contractual document that identifies the task sequence, deliverables, and provides the basis for progress payments. It is an action document, divided by the individual tasks or procedures required to accomplish the project objectives. Each task should be identified with a description of its objective, how it will be performed, and the anticipated deliverables and milestones. As appropriate, tasks should include a brief description of general operating procedures, quality control and quality assurance measures, and analytical procedures and statistical analyses to be used to optimize the quality of the data and project results. (Five [5] pages maximum)

2. Information Transfer and Dissemination Plan

- The Statement of Work must include a task for reporting and information transfer.
- Estimate the size of the market or relevant audience in NYS for the proposed project. Identify possible market or institutional barriers to successful technology transfer. Discuss strategies for disseminating and documenting dissemination of project results.
- For public-domain laboratory testing and field demonstration proposals, describe the technology transfer strategies to be used in achieving widespread use of project results. Also describe proposed documentation of use of project results.

The following reporting and information transfer work will be required for projects and should be considered in allocating resources for this task: completing monthly progress reports and a final technical report, and articles for submission to peer-reviewed journals, as appropriate. In addition, each principal investigator may be required to prepare a short paper summarizing the usefulness of their research findings for policy formulation. Principal investigators are strongly encouraged to collaborate with social scientists/policy analysts in preparing such a policy-relevant paper. Project findings to date shall be presented at annual meetings arranged by NYSERDA staff in Albany, NY. Electronic access to project data shall also be provided to NYSERDA after appropriate quality assurance.

Additional methods of information transfer and reporting may be proposed for involving pertinent policy makers or regulators and other target audience representatives during the project and for using the anticipated project results to achieve projected public benefits. Efforts to increase access to, or use of data collected, is encouraged. Outreach or education about project findings is also encouraged. (One [1] page)

3. Master Schedule

Complete a schedule showing start and completion times for all major tasks, in terms of months after project initiation. Include major milestones and meetings, tests, demonstrations, reports, and other key deliverables. The Schedule should be realistic and reflect the nature of research and/or development. (One [1] page)

4. Contract Pricing Proposal Form

Complete the attached Contract Pricing Proposal Form (Attachment C) for the entire project, including any in-kind contributions and other cost-sharing. One (1) copy of the Contract Pricing Proposal Form must contain an original signature. The degree of cost-sharing will be considered in the evaluation of proposals. Cost-sharing of at least 25% is preferred for non-product development activities. Product development efforts will require 50% cost-sharing. Leveraging of other research funding is preferable. In-kind cost-sharing is acceptable. (Not included in page count).

PART 3: Supporting Documentation
(Five [5] pages maximum plus résumes, business literature, and letters of support)

1. Management Plan and Qualifications

- Provide a brief description of each organization on the proposing team (e.g., business, not-for-profit, consulting firm, manufacturer, university etc.) and describe the business activity, approximate size and experience of each organization. Describe your research or business goals and how the proposed project would accomplish these goals.
  (Two [2] pages)
- Organizational Chart - Prepare an organizational chart listing all *key* personnel. Include any subcontractors and other sponsors involved in the project, showing their roles and responsibilities. (One [1] page)
- Tasking Chart - Prepare a tasking chart, describing approximately in hours or days the effort contributed by each of the *key* personnel to each task and the total effort.
  (One [1] page)
- Related Projects – Provide a sample of related projects that have been undertaken by the proposer and/or subcontractors. For each project, provide a brief summary, describing its title, scope, funding amount and client contact numbers. NYSERDA may contact listed clients. (One [1] page)
- Resumes - Submit relevant portions of resumes of all key project personnel, including those of proposed subcontractors. Include education and experience that are relevant to the proposed work. (One [1] page each - not included in page count)
- Business or product literature and brochures may be included. (Not included in page count)

2. Letters of Commitment or Support

If you are relying on other organizations or businesses to do work, provide services or equipment, provide data or share in the non-NYSERDA cost, include a letter from that organization or business describing their commitment. If the use of unpublished data from other researchers is necessary for the project to be successful, letters of support showing the availability of these data must be included. **Absence of letters of commitment or support will be interpreted as the proposer not having commitment/support from those parties.** (One [1] page each - not included in page count)

3. Disclosure of Prior Findings of Non-Responsibility form (see General Conditions, below, and Attachment B, not in page count)

4. Cost Sharing

A cost-share of at least 25% of the total project cost is preferred for non-product or non-proprietary process development efforts where results will be in the public domain. Cost-sharing of 50% is required for product development projects. Cost sharing can be from the proposer, other team members, and other government or private sources. Contributions of direct labor (for which the laborer is paid as an employee) and purchased materials may be considered "cash" contributions. Unpaid labor, indirect labor, or other general overhead may be considered "in-kind" contributions. NYSERDA will not pay for efforts that have already been undertaken. The proposer or proposing team cannot claim as cost-share any expenses that have already been incurred. If applicable, show the cost-sharing plan in the following format (expand table as needed) (not in page count).

	Cash	In-Kind Contribution	Total
NYSERDA	$	$	$
Proposer	$	$	$
Others (list individually)	$	$	$
Total	$	$	$

Attach supporting documentation to support indirect cost (overhead) rate(s) included in your proposal as follows:

- Describe the basis for the rates proposed (i.e., based on prior period actual results; based on projections; based on federal government or other independently-approved rates).
- If rate(s) is approved by an independent organization such as the federal government, provide a copy of such approval.
- If rate(s) is based on estimated costs or prior period actual results, include calculations to support proposed rate(s). Calculations should provide enough information for NYSERDA to evaluate and confirm that the rate(s) are consistent with generally accepted accounting principles for indirect costs.

NYSERDA reserves the right to audit any indirect rate presented in the proposal and to make adjustment for such difference. Requests for financial statements or other needed financial information may be made if deemed necessary.

Recoupment is required for product development projects greater than $50,000. Please refer to “General Conditions” in Section VIII.

Annual Metrics Reports – If awarded, the proposer will be required to submit to NYSERDA's Project Manager on an annual basis, a prepared analysis and summary of metrics addressing the anticipated energy, environmental and economic benefits that are realized by the project. All estimates shall reference credible sources and estimating procedures, and all assumptions shall be documented. Reporting shall commence the first calendar year after the contract is executed. Reports shall be submitted by January 31st for the previous calendar years activities (i.e.

reporting period). Please see Attachment E: Sample Metrics Reporting Guides for the metrics that you will be expected to provide and the reporting duration. NYSERDA may decline to contract with awardees that are delinquent with respect to metrics reporting for any previous or active NYSERDA agreement.

IV. Proposal Evaluation Criteria for Proposals Addressing Targeted Research Areas:

Proposals that meet Proposal requirements will be reviewed and ranked for technical merit, program merit, and cost-value relationship, including cost-sharing, by a Technical Evaluation Panel (TEP) using the Evaluation Criteria below. Final rankings may be based on programmatic and management considerations, such as those identified below. **If an investigator(s) identified in a proposal is an investigator on one (1) or more current or past NYSERDA-funded projects, performance on these projects will be considered in the evaluation of the current proposal.**

PROPOSAL EVALUATION CRITERIA (Categories A-H) (For Category I see Sections V and VI.)
Please note that due to the broad range of categories, topics and activities covered under this PON, not all of the specific evaluation criteria questions may be applicable for a given proposal.

Description of Proposed Project – Is the proposed project innovative and feasible? What is the energy-efficiency and emissions performance of the technology? What methods were (will be) used to measure the energy efficiency and emissions performance of the technology (i.e., test procedure)? Is a test report summary attached or linked to in the proposal? Would the proposed project achieve, enable, evaluate, quantify and communicate the potential for significant improvements in energy or environmental performance of high-efficiency biomass heating equipment, emissions control technology, pellet storage, solid fuel processing, or fuel certification? Would the proposed project evaluate or inform the impacts of biomass combustion or pellet storage on air quality or health? Would the project result in a new product? Would the project result in improved manufacturing or processing?

Value of the proposal in addressing objectives – How would the proposed project achieve, enable, evaluate, quantify and communicate the potential for, significant and cost-effective improvements in energy and environmental performance of biomass-fired heating technology in NYS? Would most, or all, of the project be performed in NYS? Would the project achieve or enable significant economic development benefits in NYS or otherwise support the objectives of Renewable Heat New York? Would the project achieve or enable improved public health in NYS?

Soundness of Project Methods – Do the proposed project methods and overall research design appear to be capable of meeting the project objectives and yielding accepted results? For product development projects, are the product development, commercialization and business milestones identified and realistic for near-term commercialization? For test method development or technology evaluations projects, will thermal efficiency and emissions ($PM_{2.5}$, CO, NO_x and particle characteristics) be measured? Will the entire burn cycle be tested and isolate the start-up, steady-state and end phases of the burn? Will performance over a wide range of loads be performed? For technology demonstration projects, how will systems be properly sized and integrated? What is the performance measurement and verification plan (measures and time resolution)? For fuel processing and feedstock evaluation projects, does the proposal work include the required analysis of feedstocks, products, and ash? Are the feedstocks NYS-relevant? For projects including boiler performance testing with non-woody fuels, does the proposal document that that the combustion chamber is compatible with the fuel type to be tested? How comprehensive, realistic, and explicit is the Statement of Work with respect to the project objectives and proposal requirements? Are specific measurable targets of success provided where applicable? Are the tasks reasonable and clearly described?

Management Plan and Qualifications – How well has the proposer organized a management plan and a project team with the necessary educational, technical, scientific, operations, technology transfer, financing, business, and administrative experience for successfully completing the project? Does the team include applicable partnerships with other groups including multi-disciplinary research groups? How many of the team members are located in NYS? Have letters of support demonstrating the availability of data and agreement to participate been included? For

projects including boiler testing on non-woody-fuels, is there a letter of commitment for product improvements based on evaluation results?

Achieving Successful Technology Transfer – Is there a substantial market or audience in NYS for the proposed work? How promising is the reporting and information transfer plan for successfully using project results to realize the potential benefits of the project? Will results be submitted for publication in peer-review journals? Are there any significant market or institutional barriers? Does the proposer describe an effective strategy for overcoming such barriers?

Budget – How justifiable and reasonable are the overall costs compared to the expected usefulness of the project results and the level of effort and duration of the project? How justified and reasonable are the proposer's cost allocations and co-funding contributions (cash, in-kind services, etc.)? Are overhead and G&A rates reasonable? Are equipment, facility, material, and travel costs based on reasonable estimates? Are the labor rates reflective of the industry? Is the cost-sharing at the preferred 25% or required 50% level for the type of project? To what degree does the proposal include meaningful cost-sharing from other key organizations important for the success of the project?

Schedule – Is the schedule realistic? Are significant milestones and delivery of reports and products identified?

Other Considerations – Projects will be reviewed to determine if they reflect NYSERDA's overall program objectives. The considerations include:

- The balance among NYSERDA projects of long-term and short-term benefits, risk/reward relationships, and similar presently or previously funded projects.
- The general distribution of NYSERDA projects among diverse commercial, industrial, and other organizations, as well as the distribution of projects within NYS.
- The general distribution of projects of diverse topics related to program goals.
- The ease of measuring project success in quantifiable ways.

If applicable, the responsiveness of the proposer in conducting other NYSERDA-funded work.

V. Program Requirements – College Teams and Competitions for Advancing Wood Stove and Pellet Stove Design and Innovation (Category I):

This PON offers a competitive award to support teams of college and university students in cordwood stove and pellet stove design. Academic institutions located in NYS are eligible to submit proposals that advance innovation of these technology types. To qualify, teams must have an identified faculty research advisor to lead the group who will be the official Principal Investigator if the proposal is selected. Awards will provide support for up to three (3) years. Annual support will be in the form of up to a $25,000 stipend, payable through the institution, which may be supplemented by the team's advisor or institution or other parties. See Section VI for Category I proposal requirements. NYSERDA anticipates funding up to four (4) teams through this PON. **Proposals must be submitted through the team's faculty research advisor.**

Proposers must submit one (1) compact disk that contains a complete proposal and Proposal Checklist (Attachment A) in pdf format. Proposers must also submit ten (10) paper copies of the completed proposal to the attention of Roseanne Viscusi at the address on the front of this Program Opportunity Notice/Request for Proposal. A completed and signed Proposal Checklist must be attached as the front cover of the proposal, one of which must contain an original signature. Late proposals will be returned and proposals lacking the appropriate completed and signed Proposal Checklist may be returned. Faxed or e-mailed copies will not be accepted.

Proposals should follow the format below and provide sufficient and succinct information to complete the required descriptions and answer the questions described in the Proposal Evaluation criteria listed in **Section VII.** The

maximum length of each proposal section is shown. **Proposals are subject to return without evaluation if more than 8 pages are submitted** (not including the Checklist Cover Sheet, Contract Pricing Proposal Forms (Attachment C), one-page letters of commitment, and resumes), or if a font smaller than 11 point is used. Proposers may contact Ellen Burkhard at (518) 862-1090, ext.3332 before preparing a proposal to discuss proposal requirements.

Proposal Format

Proposals for Category I must be in the following format and should address the questions below as may be applicable:

VI. Proposal Requirements – College Teams and Competitions for Advancing Wood Stove and Pellet Stove Design and Innovation (Category I):

Proposers must submit one (1) compact disk that contains a complete proposal and Proposal Checklist (Attachment A) in pdf format. Proposers must also submit ten (10) paper copies of the completed proposal to the attention of Roseanne Viscusi at the address on the front of this Program Opportunity Notice/Request for Proposal. A completed and signed Proposal Checklist must be attached as the front cover of the proposal, one of which must contain an original signature. Late proposals will be returned and proposals lacking the appropriate completed and signed Proposal Checklist may be returned. Faxed or e-mailed copies will not be accepted.

Proposals should not be excessively long or submitted in an elaborate format that includes expensive binders or graphics. Unnecessary attachments beyond those sufficient to present a complete, comprehensive, and effective response will not influence the evaluation of the proposal. Each page of the proposal should state the name of the proposer, PON **3027**, and the page number.
Qualified proposers (see Section V) should submit proposals using the format below (note maximum page lengths per section):

- Project title, goals and objectives. Objectives must include creating a working prototype in year one. (one [1] page)
- Statement of team recruitment strategy and expected composition with respect to student majors and years of study (undergraduate, graduate). (Half [½] page)
- Anticipated team research approach and methodology. Project relevance to advancing innovation in wood stove and wood pellet stove technologies. (Up to two [2] pages)
- Describe the expected products and outcomes. Include a timeline (one [1] page).
- Provide a brief list of any relevant courses offered by the college or university that provide educational foundation for student team members. Describe current biomass heating research by faculty participants, research or course projects by students, and opportunities for new product commercialization or business start-up support. Describe Principal Investigator involvement in the proposed effort. Describe faculty involvement beyond the Principal Investigator, if any. (Up to two [2] pages)
- Identify current college or university facilities and resources available for this project and delineate any new equipment needs. (One [1] page)
- Provide a brief budget justification (note: cost-sharing is not required, but allowed). (One -half page)

Not included in page count:

- **A letter of commitment from the college or university faculty research advisor identifying that person as the Principal Investigator (required).** If applicable, also provide a letter of commitment from any project partners external to the college or university. Resume of the college or university faculty research advisor who will serve as the Principal Investigator. Resumes of other team advisors, if any.

- Contract Pricing Proposal form - Complete Attachment C, Contract Pricing Proposal form for the entire project, including cost-sharing, if any. In-kind cost-sharing is acceptable. Cost-sharing is not required.
- Disclosure of Prior Findings of Non-Responsibility form (see General Conditions, below, and Attachment B).

VII. Proposal Evaluation Criteria for College Teams and Competitions for Advancing Wood Stove and Pellet Stove Design and Innovation (Category I):

Proposals will be evaluated based on the:

- Soundness of project goals and objectives and value of project results as it relates to advancing high-efficiency and low-emissions wood heating goals
- Teaming arrangement and educational, facility and financial support by college or university and any external partners
- Soundness of research approach and methodology
- Likelihood of prototype development in year one
- Qualifications and commitment of **college or university faculty research advisor and other** team advisor(s), if any, as determined by the submitted documents
- Allocations of funds for successful team experience and prototype outcome

VIII. General Conditions:

Proprietary Information – Careful consideration should be given before confidential information is submitted to NYSERDA 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. The NYS Freedom of Information Law, Public Officers law, Article 6, provides for public access to information NYSERDA possesses. Public Officers Law, Section 87(2)(d) provides for exceptions to disclosure for records or portions thereof that "are trade secrets or are submitted to an agency by a commercial enterprise or derived from information obtained from a commercial enterprise and which if disclosed would cause substantial injury to the competitive position of the subject enterprise." Information submitted to NYSERDA that the proposer wishes to have treated as proprietary, and confidential trade secret information, should be identified and labeled "Confidential" or "Proprietary" on each page at the time of disclosure. This information should include a written request to exempt it from disclosure, including a written statement of the reasons why the information should be exempted. See Public Officers Law, Section 89(5) and the procedures set forth in 21 NYCRR Part 501
http://www.nyserda.ny.gov/About/New-York-State-Regulations.aspx
However, NYSERDA cannot guarantee the confidentiality of any information submitted.

Omnibus Procurement Act of 1992 – It is the policy of NYS to maximize opportunities for the participation of NYS business enterprises, including minority- and women-owned business enterprises, as bidders, subcontractors, and suppliers on its procurement Agreements.

Information on the availability of NYS subcontractors and suppliers is available from:

Empire State Development
Division for Small Business
30 South Pearl Street
Albany, NY 12245

A directory of certified minority- and women-owned business enterprises is available from:

Empire State Development
Minority and Women's Business Development Division
30 South Pearl Street
Albany, NY 12245

State Finance Law sections 139-j and 139-k – NYSERDA is required to comply with State Finance Law sections 139-j and 139-k. These provisions contain procurement lobbying requirements which can be found at http://www.ogs.ny.gov/aboutogs/regulations/advisoryCouncil/StatutoryReferences.html
The attached Proposal Checklist (Attachment A) calls for a signature certifying that the proposer will comply with State Finance Law sections 139-j and 139-k and the Disclosure of Prior Findings of Non-responsibility form (Attachment B) includes a disclosure statement regarding whether the proposer has been found non-responsible under section 139-j of the State Finance Law within the previous four (4) years.

Tax Law Section 5-a – NYSERDA is required to comply with the provisions of Tax Law Section 5-a, which requires a prospective contractor, prior to entering an agreement with NYSERDA having a value in excess of $100,000, to certify to the Department of Taxation and Finance (the "Department") whether the contractor, its affiliates, its subcontractors and the affiliates of its subcontractors have registered with the Department to collect NYS and local sales and compensating use taxes. The Department has created a form to allow a prospective contractor to readily make such certification. *See,* ST-220-TD (available at http://www.tax.ny.gov/pdf/current_forms/st/st220td_fill_in.pdf). Prior to contracting with NYSERDA, the prospective contractor must also certify to NYSERDA whether it has filed such certification with the Department. The Department has created a second form that must be completed by a perspective contractor prior to contacting and filed with NYSERDA. *See,* ST-220-CA (available at http://www.tax.ny.gov/pdf/current_forms/st/st220ca_fill_in.pdf). The Department has developed guidance for contractors which is available at http://www.tax.ny.gov/pdf/publications/sales/pub223.pdf .

Contract Award – NYSERDA anticipates making multiple awards under this solicitation. It may award a contract based on initial applications without discussion, or following limited discussion or negotiations pertaining to the Statement of Work. Each offer should be submitted using the most favorable cost and technical terms. NYSERDA may request additional data or material to support applications. NYSERDA will use the Sample Agreement (Attachment D) to contract successful proposals. NYSERDA reserves the right to limit any negotiations to exceptions to standard terms and conditions in the Sample Agreement to those specifically identified in the submitted proposal (see Attachment A - Proposal Checklist and Attachment A-1 - Acceptance of Standard Terms and Conditions). Proposers should keep in mind that acceptance of all standard terms and conditions will generally result in a more expedited contracting process. NYSERDA expects to notify proposers in approximately twelve (12) weeks from the proposal due date whether or not the proposal has been selected to receive an award. **NYSERDA may decline to contract with awardees that are delinquent with respect to any obligation under any previous or active NYSERDA agreement.**

Recoupment – For any new product development projects requesting NYSERDA funding over $50,000, NYSERDA will require a royalty based on sales of the new product developed. NYSERDA's standard royalty terms are 1.5% of sales for products produced in NYS (for a period of 15 years or until the Contractor pays NYSERDA an amount equal to the amount of funds paid by NYSERDA to the Contractor, whichever comes first) and 5% of sales for products produced outside of NYS (for a period of 15 years or until the Contractor pays NYSERDA an amount equal to three (3) times the amount of funds paid by NYSERDA to the Contractor, whichever comes first).

Limitation – This PON does not commit NYSERDA to award a contract, pay any costs incurred in preparing a proposal, or to procure or contract for services or supplies. NYSERDA 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 PON when it is in NYSERDA'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 (5) years, under the laws of the United States (U.S.) or any state or territory of the U.S., 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 NYSERDA

after the award of a contract, NYSERDA 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 or the NYS Department of Labor.

IX. Attachments:

Attachment A:	Proposal Checklist
Attachment A-1:	Acceptance of Standard Terms and Conditions
Attachment B:	Disclosure of Prior Findings of Non-Responsibility Form
Attachment C:	Contract Pricing Proposal Form (CPPF) and Instructions
Attachment D:	Sample R&D Cost-Share Agreement
Attachment E:	Sample Metrics Reporting Guide
Attachment F:	Solicitation Marketing Questionnaire