Emerging Technologies Demonstration Projects - Residential HVAC
Program Opportunity Notice 3127
Up to $3.5 Million Available

Proposals Due: April 21, 2016, by 5:00 PM EST*

NYSERDA seeks to accelerate market adoption of commercially available, but underused technologies and proven building strategies for the residential building sector. Multi-site demonstration projects proposed under this solicitation will validate the use of high efficiency heating, ventilating, and air-conditioning (HVAC) equipment in existing residential building retrofits, through a comprehensive planning, design, installation, commissioning, and measurement and verification process. This Program Opportunity Notice (PON) seeks to address barriers to widespread adoption of heat pumps, including cold-climate split-system air-source heat pumps and ground-source heat pumps, and low-capacity (maximum input rating of less than 45,000 Btu/hour) natural gas furnaces, by demonstrating and validating the energy savings, cost-effectiveness and other performance indicators of these systems. Up to $3.5 million is available under this PON to fund multiple demonstration projects with broad geographic distribution across the state. NYSERDA intends to fund multiple proposals, but will not cap the value of any one proposal. Proposals that are funded must include a detailed plan for accelerating market growth for the eligible HVAC system types through technology transfer and outreach activities.

NYSERDA will host **pre-bid webinars** on **January 27, 2016, from 1:00 -2:00 pm** and **March 17, 2016, from 10:00 am to 11:00 am** to provide an overview of the services requested and requirements of this PON. Potential proposers will have the opportunity to ask clarifying questions to help prepare a response to the solicitation. To register for the March 17 webinar, please CLICK HERE.

Proposal Submission: Proposers are strongly encouraged to use NYSERDA's online electronic proposal submission portal. If submitting electronically, proposers must submit the proposal in either PDF or MS Word format with a completed and signed Proposal Checklist (Attachment A) and Disclosure of Prior Finding of Non-Responsibility Form (Attachment B), in PDF format. Proposal PDFs should be searchable and should be created by direct conversion from MS Word, or other conversion utility, rather than by scanning. For ease of identification, all electronic files must be named using the proposer's entity name in the title of the document. Proposals may be submitted electronically by following the link for electronic submissions found on this PON's webpage, which is located in the "Current Opportunities" section of NYSERDA's website**. Instructions for submitting electronically are located in that section as Attachment F to this PON.**

Please note that if a proposer chooses not to use the electronic submission process, proposers must submit one (1) paper copy and one (1) CD of the proposal with a completed and signed Proposal Checklist attached to the front of each copy, one of which must contain an original signature. **Proposals must be clearly labeled and submitted to: Roseanne Viscusi, PON 3127, NYS Energy Research and Development Authority, 17 Columbia Circle, Albany, NY 12203-6399**

Technical questions concerning this solicitation must be directed to Daniel Farrell at (518) 862-1090, ext. 3490 or daniel.farrell@nyserda.ny.gov. Contractual questions concerning this solicitation must be directed to Nancy Marucci at (518) 862-1090, ext. 3335 or nancy.marucci@nyserda.ny.gov.

No communication intended to influence this procurement is permitted. Contacting anyone other than the Designated Contact (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 offeror, and (2) may result in the proposer not being awarded a contract.

*Late, incomplete, or unsigned applications will be returned. Faxed or e-mailed applications will not be accepted. Applications 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 website at www.nyserda.ny.gov.

I. INTRODUCTION

The **Emerging Technologies Demonstration Projects - Residential HVAC** initiative seeks to accelerate the market uptake of commercially available, but underused building technologies and strategies in the residential sector, that will deliver significant and measurable energy savings and greenhouse gas (GHG) reductions for existing homes and residential buildings. This PON is primarily funded through NYSERDA's Technology and Market Development (T&MD) portfolio, and is a component of the Advanced Building Technologies initiative, which seeks to address New York-specific building needs and barriers to full market adoption of new and/or underutilized building technologies and practices. New York's residential buildings account for more than 35 percent of total electricity consumption in the state, and are responsible for nearly 28 percent of net energy consumption in the state. In addition, the residential sector accounts for almost 18 percent of the state's GHG emissions. Opportunities for energy efficiency gains beyond traditional retrofit techniques and HVAC system replacements have been limited by the underuse of emerging technologies that often face barriers to widespread adoption.

This PON seeks proposals for multi-site demonstration projects throughout the State that address the barriers to wider commercialization of eligible HVAC systems in the existing residential building market (not new construction or substantial renovation (gut rehabilitation) projects). Proposals must include a minimum of five demonstration sites in a single market area and each site must demonstrate the same HVAC technology. Up to $3.0 million is available for sites located in System Benefits Charge (SBC) territory[1]. Additionally, up to $500,000 is available for sites located in PSEG-Long Island service territory, or sites served by municipal electric systems or rural electric cooperatives. Eligible emerging technologies include: 1) air-to-water and air-to-air split system heat pumps (specifically, cold climate air-source heat pumps, including ductless and ducted "mini-split" systems); 2) ground-source heat pumps (GSHPs) including water-to-air and water-to-water units; and, 3) low-capacity modulating gas furnaces (maximum input rating of less than 45,000 Btu/hour).

Known market barriers for these systems include, but are not limited to: lack of consumer and installer awareness/demand; lack of high-quality field performance data in New York; small trained installer base; under-developed supply chain; higher up front material, increased design and/or labor costs; technical challenges relating to heating load calculations, energy modeling, energy savings calculations, controls strategies, and installation/commissioning; and uncertainties with regard to system performance. Other barriers specific to split system air-source heat pumps (ASHPs) include: perceptions of poor cold-climate performance; consumer concerns about appearance of indoor units (for mini-splits). Air-to-water and variable refrigerant flow (VRF) heat pump systems are not the primary target of this solicitation, but may be proposed if the size or complexity of the building warrants it as the appropriate system choice and substantial market transformation benefits can be achieved through the demonstration.

II. DEFINITIONS

Commercially Available: A technology, building strategy, or approach that has been available in the marketplace for at least six months, can be accessed through standard sales or distribution channels, has manufacturer or independent third-party performance data publicly available, offers an industry-standard manufacturer's warranty, has been successfully demonstrated or installed, and for which marketing and sales efforts are underway.

Demonstration Partner Clearinghouse: To support a teaming approach, NYSERDA has created a clearinghouse for potential demonstration partners. The clearinghouse contains contact information for companies that have expressed interest in participating in a PON 3127 demonstration project. Proposers are encouraged, but not required, to review the clearinghouse for potential demonstration partners; proposers do not have to list their business on the Demonstration Partner Clearinghouse. The clearinghouse can be found online at: http://www.nyserda.ny.gov/resetac-clearinghouse.

[1] Customers served by one of the following investor-owned utilities: Central Hudson Gas and Electric, Consolidated Edison, National Grid, New York State Electric and Gas, Orange and Rockland, and Rochester Gas and Electric.

Demonstration Site – For purposes of this PON, the house or dwelling unit where HVAC equipment is replaced.

Eligible Project Costs Project costs eligible for funding under this PON or for inclusion as cost-share include the incremental costs associated with planning, design and product specifications related to the demonstration components and scope of work, equipment upgrades, measurement and verification, and technology transfer activities associated with the project(s). For the HVAC system itself, eligible incremental costs under this PON cannot exceed 50 percent of the cost of standard replacement equipment.

Emerging Technology A commercially available product, technology, or building strategy that is underused. Products must be code compliant and have cost data and any applicable performance testing data available.

Technology Transfer Activities involving promotion of the technology, building strategy, or approach and associated demonstration results to stakeholders in the residential energy sector, resulting in significant market development. Technology transfer activities may include, but is not limited to, the development of videos, training, case studies or technical papers; the presentation of information at webinars, seminars, or conferences; and media or open house events.

III. ELIGIBILITY

a. Services Requested

This PON seeks proposals for multi-site demonstration projects that will increase market adoption of Emerging Technologies in residential HVAC equipment, including heat pumps (specifically, cold-climate split system air-source heat pumps and ground-source heat pumps) and modulating, low-capacity natural gas furnaces, in the residential retrofit market. Demonstration projects must incorporate building envelope and HVAC system energy use and GHG emissions reductions (relative to minimum efficiency equipment), increase awareness of opportunities for residential applications for eligible HVAC technologies, and identify and address barriers to widespread adoption of the eligible Emerging Technologies through technology transfer activities.

b. Program Eligibility

i. Proposals must include a minimum of five (5) demonstration sites, in an identified market area (e.g. New York City, Hudson Valley, Western New York, etc.) in the existing residential building market.

ii. Proposal must specifically address market barriers for the eligible HVAC technology, including but not limited to those noted on page 2 of the Introduction.

iii. Demonstration sites must be located in New York State, and be physically located in the service territory of a utility that participates in the SBC, PSEG-Long Island service territory, or a municipal electric system or rural electric cooperative administered by the New York Power Authority (NYPA).

iv. Demonstration projects must include a Home Performance with ENERGY STAR (HPwES) contractor in good standing with NYSERDA as a team member[2]. The contractor must hold appropriate Building Performance Institute (BPI) credentials (e.g. Envelope, Heating, and AC/Heat Pump). Demonstration projects included in the proposal may also participate in a related NYSERDA program, such as HPwES or EmPower New York, but this is not a requirement. However, all health and safety procedures and ventilation requirements shall be met per BPI standards.

v. It is expected that renewable energy system(s), which may include either or both solar photo-voltaic (PV) and solar thermal (ST), or other on-site market-ready renewable energy system, will be installed to offset a significant portion of the electrical load for the buildings. For projects with renewable energy systems, the installer will need to be a key member of the project development team. Solar

[2] To be considered in good standing in a NYSERDA program, the contractor or installer must have a participation status designation of Full in their respective program. For more information on participation status in NYSERDA's residential programs, please refer to the Partnership Agreement for that program.

photovoltaic (PV) or solar thermal installers that are part of a demonstration team must also be a participant in NYSERDA's applicable (solar PV or solar thermal) deployment program, and be in good standing in that program.

vi. Retrofit projects in both the market rate and affordable (income-qualified) housing market segments are eligible for funding.

vii. Retrofit projects must meet the general eligibility criteria for NYSERDA's residential programs, which includes: detached or attached single-family homes and residential structures with four (4) or fewer dwelling units, constructed using building techniques common to wood-framed residential construction, which can be served by residential scale HVAC equipment (e.g. maximum furnace input rating of 225,000 Btu/hour). Housing for income-qualified tenants and/or owners (affordable housing projects) are also eligible for PON 3127 funding, provided that the building configuration conforms to the guidelines above.

viii. **Eligible technologies (systems) include only the following:**

- Single- or multi-port ductless ASHPs (ductless mini-splits)
- Single-port ASHPs with compact duct layouts (ducted mini-splits)
- Variable Refrigerant Flow (VRF) heat pumps
- Air-to-water heat pumps
- Ground source heat pumps (GSHPs) including water-to-air and water-to-water systems
- Low-capacity modulating (condensing) gas furnaces, with maximum input capacity of less than 45,000 Btu/hour.

Associated controls, thermostats and energy management systems, including but not limited to manual or automatic controls such as occupancy sensors, outdoor temperature resets for heating equipment, and web-connected thermostats which allow for demand response capability, are not eligible technologies per this PON, but are expected to be included as part of an effective HVAC system control strategy for the demonstration projects.

ix. Demonstration projects are required to include cost-effective energy efficiency retrofit scopes of work, including building envelope improvements to reduce energy loads, and must incorporate one of the below approaches:

- Replacement of an existing electric-resistance, oil, propane, or natural gas heating system at or near the end of its useful life with a heat pump (ASHP or GSHP); air-conditioning (if it exists) could be central or room, but will be replaced by the heat pump;

- Adding an ASHP indoor unit or port to a zone (or zones) without removing existing heating system. In this scenario, the primary benefit may be shoulder-season heating and cooling, with the existing heating system left in place as back-up or for very cold periods. For this use case, the heat pump and existing system will typically have separate thermostats, therefore a control system and occupant education strategy must be proposed to avoid situations where the existing (back-up) system is firing excessively, or the heat pump turns on in cooling mode to counteract the existing heating system;

- Replacement of an existing natural gas furnace with a low-capacity unit; potential for replacement or re-configuration of existing duct system with small-diameter ducts;

- Deep-Energy Retrofit -- the ASHP or GSHP will replace existing electric-resistance, oil or propane heating system (and any cooling equipment, if it exists); coupled with extensive (exterior) shell work, and installation of solar PV system, home will achieve net-zero or near net-zero energy use (measured at the site) on an annual basis.

x. All equipment and materials installed must be commercially available, proven in the field, have an industry-standard manufacturer's warranty, and meet all applicable codes and testing requirements. **Please note: PON 3127 will not fund research and development activities, including product testing.** HVAC equipment installed must hold best-in-class designation through ENERGY STAR, AHRI, CEE or other reputable third-party certifier. If a GSHP is installed, ground-source (or geothermal) heat pump heat pump installer must have current International Ground Source Heat Pump Association (IGSHPA) certification, or proof of satisfactory completion of manufacturer's certification program. Air-to-air heat pump equipment installed must meet the criteria (and be completely and currently listed) on Northeast Energy Efficiency Partnership's (NEEP) cold-climate heat pump specification web site at the time of installation.

c. Potential for Replication

To impact the market for Emerging Technologies and practices outlined in the residential sector, it will be necessary for very advanced energy-efficiency performance retrofits to push beyond demonstration projects to the broader residential sector. To this end, the design and implementation of demonstration projects under this solicitation must have the potential to be scalable and achieve similar results in comparable residential structures. Versions of project documents (bid documents, system layouts or schematics) must be developed so that they can be made publicly-available and utilized, i.e. no identifying information regarding the owner and/or location of the building. Proposals shall include information on known construction trades knowledge gaps that should be addressed to facilitate making advanced energy efficiency performance the rule rather than the exception. **Retrofit strategies should be planned and accomplished such that minimal disruption of occupant's daily lives will occur (i.e. substantial or gut-rehabs that require occupant(s) to vacate, or of existing vacant buildings, are not eligible).**

d. Demonstration Project Completion

Demonstration projects should be completed in a timeframe that will allow for the results to impact ***current market barriers*** to the broader adoption of the subject approaches and technologies in the residential sector.

e. Measurement and Verification (M&V) and Data Collection

NYSERDA will engage a third-party M&V technical services contractor to conduct M&V activities in a consistent manner across all of the demonstration sites. These M&V activities will primarily focus on determining actual energy and utility bill savings and overall effectiveness of the demonstration project, through any needed data collection activities. Data collection is not necessarily limited to energy use: other data of interest (such inside and outside temperatures, system airflows, relative humidity, etc.) may also be collected, as they relate to occupant comfort and overall effectiveness of the retrofit approach. **The M&V Technical Consultant will work directly with the successful participants to coordinate M&V planning, site access, instrumentation and data collection, and any needed system troubleshooting.** M&V methods will follow recognized and published industry standards or protocols for collecting and evaluating quantitative and qualitative data at building sites, such as the appropriate option under the International Performance Measurement and Verification Protocol (IPMVP), Federal Energy Management Program (FEMP) M&V Guidelines, or American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Guideline 14, or other appropriate protocols. Due to seasonal variations/patterns of energy use, monitoring must be conducted for a period of at least nine (9) months and include summer, winter, and a shoulder season. If data is not collected for twelve (12) months, data will be annualized to reflect a full year of usage. Once M&V is completed, the results will be weather-normalized and compared to predicted project energy savings.

Occupant/user response to the installed HVAC system and associated envelope work will be required in order for the M&V Technical Consultant to complete its M&V activities. Additionally, Occupant/User consent will be required in order for the M&V Contractor to obtain energy usage information. The Proposer shall support the M&V process planned and executed by the assigned Technical Consultant

contracted by NYSERDA. Proposers should not include M&V activities in the budgets provided with their proposals. The extent to which proposers will be involved in occupant satisfaction surveys will be negotiated on a case-by-case basis, with successful proposers. Proposers must identify high-level data that should be obtained as a part of occupant satisfaction work, as part of their proposals.

f. Technology Transfer

Proposers will be required to collaborate on technology transfer activities to communicate the results of the demonstration projects to the residential energy community, including builders, contractors, designers, and installers, in addition to consumers. Proposals must include plans for conducting technology transfer activities, which may include videos, webinars, seminars, conference presentations trade publications, and social media, and explain how these activities will lead to significant market development. New and/or innovative technology transfer strategies or approaches are welcomed to achieve greater scale in tech transfer. If the homeowner or occupant agrees to a public event, such as an open house or model home event, these may be conducted. NYSERDA will take the lead in and assume the cost of developing case studies, however the proposer will be required to provide key project details, photos, evaluation data and/or results, and other relevant data to be determined on a project-by-project basis. A final report documenting the project design and outcomes shall be developed.

g. Teaming

Proposers are encouraged to work in teams consisting of industry professionals[3] to develop proposals and conduct demonstration projects to draw on the expertise and resources from the various actors in the residential energy sector and to maximize technology transfer opportunities. In addition to the required BPI certified contractor, NYSERDA suggests that teams include an engineering professional or energy consultant, and manufacturer's representative, at a minimum. Teams may also include design professionals, renewable energy system installers, workforce training institutions, retailers, wholesalers, or other service providers. While not a requirement of this PON, the extent to which proposals involve teaming and complementary skill sets increasing the likelihood of success of the demonstrations and market development, will be factors considered in the proposal evaluation.

To support the development of team proposals, a clearinghouse for potential demonstration partners has been created by NYSERDA and is available online at: http://www.nyserda.ny.gov/resetac-clearinghouse. Companies listed in the clearinghouse have expressed an interest in participating in demonstration projects for emerging technologies. NYSERDA cannot guarantee that the companies listed in the clearinghouse will participate in a given project: the proposer should be prepared to conduct outreach to additional companies for the purpose of creating a complete and effective team. For contractual and project management purposes, the proposer should be the team leader and the primary contact for NYSERDA throughout the duration of the project and will be the entity contracting with NYSERDA.

h. Proposer Qualifications

Proposers and proposing team members should hold applicable professional experience and/or qualifications (licenses, certifications, and/or accreditations) necessary for the relevant design, construction, or retrofit work. If a team is proposed, proposals must also demonstrate that the teaming arrangement is sufficiently representative of the residential energy field and is directly applicable and consistent with the goals of this PON.

i. Cost-Effectiveness

[3] Industry professionals in the residential sector include consumers, home performance and energy services contractors, builders, architects and design professionals, product manufacturers, workforce training organizations, retailers and wholesalers, and other trade professionals and service providers.

An assessment of the cost-effectiveness of the proposed technology or building strategy must be conducted and include a simple customer payback calculation[4] for the proposed technology or strategy. The simple payback should indicate the length of time in years necessary to recover the incremental costs of purchasing and installing, or implementing the proposed technology or strategy through bill savings. The assessment should include an identification of the inputs used to calculate the payback period including the incremental and installation costs, energy consumption, electricity and/or gas prices utilized, and estimated useful life of the installed equipment. Costs related only to the demonstration, such as data collection and analysis or technology transfer initiatives, should be omitted from the calculation. While it is not required that the proposed technology or strategy be cost-effective within a certain timeframe, preference will be given to technologies and strategies that are more cost-effective or have the potential to be most cost-effective in the near future. For technologies or strategies that are not currently cost-effective (i.e. payback period exceeds average useful measure life), proposals should describe the factors that will contribute to achieving cost-effectiveness of the technology or strategy and the estimated timeframe for doing so.

j. Final Project Report

Upon completion of the demonstration project, the contractor will submit a final report to the NYSERDA Project Manager that will include the following:

- Overview of the demonstration project, detailing the methods used in developing, implementing, and monitoring the demonstration sites;
- Identification of the technologies or building retrofit strategies that were demonstrated, including the relevant product data;
- Identification and discussion of the barriers to broad adoption of the technology or retrofit strategy and how the results of the demonstration overcome those barriers;
- Quantitative and qualitative assessment results, including the data points identified in Subsection e, Measurement and Verification and Data Collection (note that NYSERDA will require delivery of all data and analysis accomplished by NYSERDA's M&V contractor to the demonstration contractor for inclusion in the report);
- Description of the operating performance of the demonstrated technology or building strategy, including the quality of performance and the identification of any performance barriers associated with the technology or building strategy;
- Cost-effectiveness calculations, including simple payback, updated to reflect learning from the demonstrations. List all inputs used in the payback analysis, including incremental cost of technology or strategy, installation costs, estimated energy savings, and measure life. If the technology or strategy is not currently cost-effective, discuss the likelihood of its achieving cost-effectiveness in the future;
- Discussion of the impact that the project will have on the market adoption of the technology or building retrofit strategy; and
- Summary of planned community and general public marketing of the results.

The format of the Final Project Report will follow NYSERDA's established reporting guidelines and content must be agreed upon between the Proposer and NYSERDA Project Manager prior to finalization.

k. Proposer's Responsibility

The Proposer will be responsible for the timely completion of the requirements described in this PON and the resulting contract. The selected Proposer assumes overall responsibility for coordinating all members of the demonstration team as noted in the proposal, and producing agreed-upon deliverables on time and within budget. The Proposer is also responsible for ensuring that the demonstration projects are coordinated with the appropriate NYSERDA residential energy services program, and that the project meets the requirements for and adheres to the guidelines for that program, beyond the demonstrated technology.

[4] A simple payback calculation does not take into account compounded savings or discount and inflation rates.

l. NYSERDA's Responsibility

A NYSERDA Project Manager will be the primary contact at NYSERDA for the Proposer and will be responsible for managing and overseeing all tasks undertaken by the selected Proposer including but not limited to approving tasks and any subsequent deliverables. In addition, the Project Manager will review and approve plans for site selection, data collection, and M&V prior to the commencement of the demonstration project. The Project Manager will also coordinate the development of any case studies and media communication with the Proposer and NYSERDA's Marketing Department.

m. Available Funds, Eligible Costs, and Payments

Up to $3.5 million is available for PON 3127 and NYSERDA expects to receive and fund multiple proposals through this competitive solicitation. The Proposer or proposing team is strongly encouraged to contribute to the cost of the demonstration project in the form of cost-sharing and/or in-kind contributions. The level of cost-share or in-kind contribution provided will be considered in the evaluation process.

Funding available through this PON is intended to offset the ***incremental cost*** of the demonstration project after proposer cost share, customer (homeowner) contribution, and any applicable NYSERDA program incentives are considered. Incremental costs that are eligible under this PON may not be eligible for incentives or funding under any other NYSERDA or Utility Program. Incremental project costs include planning, design and product specifications related to the demonstration components and scope of work, equipment upgrades, measurement and verification, and technology transfer activities associated with the project(s). For the HVAC system itself, eligible incremental costs under this PON cannot exceed 50 percent of the cost of standard replacement equipment. This means, for example, in an existing home being retrofitted, eligible costs for reimbursement or cost-share include: the additional (incremental) costs of the design work and over-and-above costs associated with any installed materials or components related to the demonstration components of the project; M&V activities; reporting, and technology transfer. **Other retrofit costs, including those needed to meet the requirements of a related NYSERDA program, are not eligible for reimbursement through this PON, and those costs, along with any incentives that may be provided by the related NYSERDA program, cannot be considered as cost-share for purposes of the demonstration projects.** For example, any customer contracts established through HPwES will specify the incremental costs associated with the Eligible HVAC Technology being demonstrated through this PON (over standard replacement equipment meeting minimum HPwES efficiency requirements.)

Payments will be based on the completion of tasks, on a milestone basis, as outlined below:

1. Payment 1: 10 percent of award following approval of the Statement of Work (SOW), project timeline, site selection plan, and executed demonstration site agreements;
2. Payment 2: 60 percent of the award following design/specification work, and completion/execution of the retrofit strategy, including installation of specified components;
3. Payment 3: 30 percent of award following completion of all M&V and data acquisition, submission and approval of final project report, and satisfactory completion of all technology transfer obligations.

IV. PROPOSAL REQUIREMENTS

For proposers not utilizing the NYSERDA electronic submittal portal, proposers must submit one (1) paper copy and one (1) CD of the proposal with a completed and signed Proposal Checklist attached to the front of each copy, one of which must contain an original signature. Proposals must be clearly labeled and submitted to: Roseanne Viscusi, PON 3127, NYS Energy Research and Development Authority, 17 Columbia Circle, Albany, NY 12203-6399. A completed and signed Proposal Checklist (Attachment A) must be attached as the front cover of your proposal,

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, the PON number, and the page number. The proposal must be in the following format:

PON Proposal Checklist: The Proposal Checklist to be completed is attached to this PON. The checklist must be attached to two (2) copies of Part I of the proposal. At least one (1) copy must contain an original signature.

Section 1: Introduction and General Information (1 page)
Proposers should summarize the main objectives of their demonstration project, key information about their organization and proposed team members, and their qualifications to perform and complete the services requested under this PON.

Section 2: Technology Identification, Market Assessment, and Value of Demonstration Project (1-3 pages)
Identify the HVAC technology and building retrofit strategy that is proposed for demonstration; where applicable, include information on the manufacturer, certifications achieved, and any available cost and performance data. Include a brief assessment of the market for this technology or practice, including background on the market penetration of the technology or practice, a description of the existing market including sales data, potential future market size, or other evidence that the technology or practice is commercially available, yet underutilized and should be part of a demonstration project. Identify any unique characteristics of the most promising market for the technology or strategy, as applicable. This may include building size, configuration, vintage, current heating systems or fuel, or other characteristics.

Identify confirmed or perceived barriers that have limited market adoption of the Eligible Technology. Explain how the proposed demonstration will help overcome these barriers. Identify target market, including the customer and building types for which the technology or approach is most appropriate, identify and plan activities to develop the suppply chain (manufacturers, distributers, installers, service and maintenanc eprofessionals) and identify and plan targeted outreach/marketing. Articulate any additional benefits, including economic benefits to New York State, that will be achieved through the demonstration projects.

Estimate the potential energy and energy cost (bill) savings associated with the eligible HVAC technology and building retrofit strategy. Include cost estimates for each of the components of the technology or building strategy, including design, specification, equipment, installation, commissioning, operations and maintenance, and technology transfer. Provide an assessment of the cost-effectiveness of the proposed technology or strategy in terms of a payback calculation. List all inputs used in the payback analysis, including incremental cost of technology or strategy, installation costs, estimated energy savings, and measure life. If the technology or strategy is not currently cost-effective, discuss the likelihood of its achieving cost-effectiveness in the future.

This section should also include a discussion on the potential for the demonstration project to be replicated, including how the building strategy or approach could be implemented to achieve similar results at broader scale in comparable residential structures, and how the demonstration will result in significant market development. **Retrofit strategies should be planned and accomplished such that minimal disruption of occupant's daily lives will occur (i.e. substantial or gut-rehabs that require occupant(s) to vacate, or of existing vacant buildings, are not eligible).**

Section 3: Staffing Plan and Management Structure (1 page)
Proposals should identify all members of the proposing team, including the team lead (primary contractor). Provide a clear description of the roles and responsibilities of each team member in completing the demonstration project. Provide an organizational chart for the team and a plan for coordinating team resources. Resumes for key personnel should be provided in an appendix.

Section 4: Qualifications (1 – 2 pages)
Describe the qualifications and expertise for each team member, and how the team member will contribute to successful completion of the objectives of this PON. List and describe any relevant experience or projects that have been completed by members of the proposing team. Indicate which team members were responsible for each project described. In particular, describe the expertise and experience of the team member(s) who will be responsible for coordinating with NYSERDA's M&V contractor, and for any additional data collection and analysis. Include the name and telephone number of at least three (3) references who are familiar with previous work of the any of the team members. Summaries of prior work may be submitted as an appendix.

Section 5: Statement of Work (2-3 pages)
The Statement of Work (SOW) is a detailed work plan of how the Proposer will accomplish the objectives of the Program and is the primary contractual document that identifies the deliverables and milestones, and also provides a basis for payment. The SOW should clearly articulate strategies consistent with the Eligibility section of this PON and detail the approach and rationale for accomplishing tasks necessary to implement the demonstration projects. Tasks should include planning, site selection, design, installation, coordination related to M&V and data collection, reporting, and technology transfer. The SOW should include general details on the plans for each task; specific plans for the completion of these tasks should be included in Section 6. Include deliverables, such as final schedules, plans, reports, photos, or presentation slides, as appropriate, for the tasks.

Provide a schedule and timeline for the completion of each task in the SOW, as well as dates for deliverables. The schedule may be provided in the form of "months after contract award." Proposer should indicate whether there are specific timeframes, such as seasons, or specific start dates, necessary for any tasks to ensure data validity or to maximize technology transfer opportunities.

Section 6: Detailed Plans (6-8 pages)
This section should include specific details for accomplishing the site identification, project planning and execution, and technology transfer components of the demonstration project(s). The plans should be structured as follows:

Demonstration Site Identification and Recruitment (1-2 pages)
Identify the demonstration sites. If they are not yet identified, describe how and when identification will take place, and note any challenges that will have to be overcome in order to secure sites. Provide the number, geographic distribution, and general building characteristics (such as existing HVAC system and fuel source) of the demonstration sites that will be included in this project. Building characteristics should include those that are representative of the target market, such as vintage, building configuration and construction quality, mechanical system(s), and market segment (e.g. affordable), where applicable. If demonstration sites have already been recruited, provide letters of commitment as an appendix.

Retrofit Planning and Execution (3-4 pages)
Proposals should include a detailed plan for the retrofit strategy planning/scoping process; the project execution plan and timeline, including team member roles and responsibilities; the proposed envelope retrofit scope; the HVAC system proposed to be installed; any post-retrofit commissioning or quality assurance procedures; also describe occupant education activities, if this is an anticipated need.

Technology Transfer (2-3 pages)
Outline strategies for communicating the results of the demonstration projects and engaging stakeholders within the residential energy field including consumers, home performance contractors, builders, architects and engineers, retailers and wholesalers, trade associations, and workforce education and training institutions. Be specific regarding annual events or conferences that may be used as a venue for presentations. Also include plans for coordinating with NYSERDA's M&V contractor and NYSERDA to produce case studies and news releases.

Section 7: Cost Proposal (Use Attachment D: CPPF)

A total project budget, including cost elements, must be provided using the attached Contract Pricing Proposal Form (CPPF), Attachment D. Provide a task budget that details total costs and cost elements per task. If applicable, provide a budget for each subcontractor or team member involved with the project. Provide detailed budget breakdowns (using the Supporting Schedule for the CPPF) for materials, equipment, travel, and any other costs.

Cost sharing is not required, however the level of cost share provided is a consideration for proposal evaluation. It is recommended that proposers and team members (such as manufacturers) that stand to benefit from the demonstration project share in the cost of the project. 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 which have already been undertaken. The proposer or proposing team cannot claim as cost-share any expenses that have already been incurred prior to being notified they are a successful proposer. Cost-sharing applies only to incremental costs associated with the demonstration project, and cannot include any costs that would have been part of a typical retrofit that did not include the technology or strategy being demonstrated. Costs related to requirements of, or incentives from, related NYSERDA programs, such as HPwES, also cannot be included as cost-share. Show the cost-sharing plan in the following format (expand table as needed):

	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). Calculation 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.

Appendices:

Resumes of Key Personnel
Summaries of Prior Work
References
Letters of Commitment
Other Supporting Materials

Procurement Lobbying Requirements - **State Finance Law sections 139-j and 139-k**
Procurement lobbying requirements contained in State Finance Law sections 139-j and 139-k became effective on January 1, 2006. (The text of the laws is available at: http://www.ogs.ny.gov/aboutogs/regulations/advisoryCouncil/StatutoryReferences.html). In compliance with §139-j and §139-k of the State Finance Law, for proposals submitted in response to this solicitation that could result in agreements with an annual estimated value in excess of $15,000, additional forms must be completed and filed with proposals: (1) a signed copy of the Proposal Checklist (Attachment A) including required certifications under the State Finance Law and (2) a completed Disclosure of Prior Findings of Non-Responsibility form (Attachment B). Failure to include a signed copy of the Proposal Checklist referenced in this solicitation will disqualify your proposal.

V. PROPOSAL EVALUATION

All proposals received by the due date and meeting the submission requirements established in this PON will be reviewed and ranked by a Technical Evaluation Panel (TEP) consisting of NYSERDA staff and selected external technical experts. Final proposal rankings and contract awards will be determined based on the following criteria, listed in order of importance. Final awards shall be based upon proposal evaluation and geographic distribution across New York State.

Responsiveness to the Program Components and Requirements of the PON (25 points)

- Does the proposal comply with eligibility and proposal requirements?
- Are the proposed materials, equipment and/or system components commercially available, as defined in Section II, and underused in the residential sector?
- Is the proposed building retrofit strategy well-articulated?
- How well does the proposal identify and address market barriers?
- Does the proposal identify the demonstration sites or provide a viable plan for site recruitment?
- How well does the Statement of Work describe the rationale and approach the proposer will take to accomplish the goals of the project?
- Is the proposed project timeline realistic and sufficient to address current market barriers for the subject technologies and/or practices?
- Does the proposal demonstrate attention to detail on the part of the proposer? Is the proposal clearly-written and well organized?

Technology Transfer Plan (20 points)

- Is the technology transfer plan adequate to communicate the results of the project to the diverse stakeholders in the residential energy field?
- Are the technology transfer strategies proven or innovative in ways likely to succeed in significantly developing the market?
- Does the plan make good use of existing venues or annual events, and maximize opportunities related to the various team members?

Potential for Replication (20 points)

- Does the demonstrated technology or building strategy have potential for wide-scale replication in the residential sector? Is this clearly described in the proposal?
- Do the proposed activities under Technology Transfer Plan address significant barriers to replicability?
- Is the proposed technology or building approach currently cost-effective? If not, what is the likelihood that it will become cost-effective in the next several years?

Project Cost and Value (10 points)

- How significant is the potential market opportunity relative to the proposed project cost?

- Is the funding requested adequate and reasonable to achieve the proposed results?
- Are proposed costs and indirect rates reasonable relative to other proposals?

Qualifications, Experience, and Management Structure (10 points)

- Does the proposal include a teaming arrangement, with structure/roles and responsibilities clear?
- Does the team represent diverse stakeholders from the residential energy sector?
- Does the proposal demonstrate that the proposer and team members have necessary qualifications and experience to undertake the demonstration projects as proposed?
- How well does the management plan coordinate team resources?
- Do references confirm the ability of the team to perform this work?

Affordable Housing (5 points)

- Are the buildings designated as affordable housing, or for income-qualified tenants and/or owners?

Cost Sharing (5 points)

- Does the proposed project include cost sharing? If so, how does the level of cost share compare to other proposals being evaluated?
- Does the level of cost share demonstrate a significant contribution by the proposer or team members?
- Are the parties most likely to benefit from success contributing to the cost-share?

Economic Benefit to New York State (5 points)

- Does the proposed project provide economic benefit to New York State?
- Has the proposing team demonstrated knowledge of New York State markets and an ability to reach relevant New York State stakeholders?

VI. PRE-BID WEBINAR

NYSERDA hosted informational webinars on **January 27, 2016 from 1:00 pm to 2:00 pm** and March 17, 2016 from 11:00 am to noon, to provide an overview of the services requested and requirements of this PON. Potential proposers will be able to ask clarifying questions to help prepare a response to the solicitation.

VII. 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://nyserda.ny.gov/~/media/Files/About/Contact/NYSERDARegulations.ashx
. However, NYSERDA cannot guarantee the confidentiality of any information submitted.

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

Information on the availability of New York 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 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 New York State 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 prospective 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 Proposal Checklist). 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 eight (8) weeks from the proposal due date whether your 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. **NYSERDA reserves the right to adjust final awards based upon geographic distribution across New York State.**

Limitation - This solicitation 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 solicitation when it is in NYSERDA's best interest. NYSERDA reserves the right to reject proposals based on the nature and number of any exceptions taken to the standard terms and conditions of the Sample Agreement.

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 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 New York State Department of Labor.

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VIII. Attachments:

- Attachment A- Proposal Checklist
- Attachment B- Disclosure of Prior Findings of Non-Responsibility Form
- Attachment C- Instruction to Contract Pricing Proposal Form (CPPF)
- Attachment D- Contract Pricing Proposal Form (CPPF)
- Attachment E- Instructions for Electronic Submission
- Attachment F- Sample Agreement