



Request for Proposals: RFP #50335 Residential End Use Load Research (EULR) Study

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1 Introduction

About the Northwest Energy Efficiency Alliance

The Northwest Energy Efficiency Alliance (NEEA) is an alliance of more than 140 utilities and energy efficiency organizations working on behalf of more than 13 million energy consumers. NEEA is dedicated to accelerating both electric and gas energy efficiency, leveraging its regional partnerships to advance the adoption of energy-efficient products, services and practices.

Since 1997, NEEA and its partners have saved enough energy to power more than 900,000 homes each year. As the second-largest resource in the Northwest, energy efficiency can offset most of our new demand for energy, saving money and keeping the Northwest a healthy and vibrant place to live. For further information, visit www.neea.org

2 Background

This Request for Proposals (RFP) is part of a research project that is a collaboration between NEEA and the Bonneville Power Administration (BPA), Clark County PUD, Energy Trust of Oregon, Northwest Power & Conservation Council, Portland General Electric, Puget Sound Energy, Seattle City Light, Snohomish County PUD, and Tacoma Power (collectively “NEEA and Partners”).

NEEA and Partners are seeking a qualified contractor or team of contractors to conduct long-term residential End Use Load Research (hereafter “EULR”) for the Northwest over a 5-year period. This EULR will be a broad, regional study to provide a current characterization of the continuous energy consumption (5-minute intervals) of key, targeted electric end uses within single-family homes, multi-family structures, and manufactured homes (the “EULR Study”).

The EULR Study will use circuit metering to gain insight on continuous energy use patterns for key end uses such as heat pumps, central air conditioning, electric baseboard heaters, and heat pump water heaters. NEEA and Partners are particularly interested in measuring electricity use of heating and cooling systems. The resulting information will be used by NEEA and Partners for more accurate measurement of available energy efficiency and capacity savings, demand response program planning, improved load forecasting, distribution planning, transmission planning, and financial planning. The project is anticipated to begin in 2018 and end in 2023.

An earlier study was conducted by NEEA that metered approximately 100 homes in the Residential Building Stock Assessment Metering study (the “2012 RBSAM”) following the Residential Building Stock Assessment characteristics study (the “2011 RBSA”). The EULR Study is envisioned to use different methods of data collection than those used in the 2012 RBSAM. Most importantly, the metering will be conducted only at the circuit panel level (i.e. not at the equipment level), and the sample will grow by 100 homes per year in the first four years, with 400 homes being metered in year five. End use data from the 2012 RBSAM are available online to inform sampling needs and to augment the EULR Study where applicable.

To the extent possible, EULR Study participants will be recruited from residential electricity customers who are currently participating in the 2016 RBSA, which is expected to conclude at the end of 2017. Initially, it is hoped that this will facilitate recruitment and selection of

residential participants with the desired end uses.

Bidders may propose augmenting the study with data from other sources, such as past studies of individual end uses in the Northwest region.

3 Research Objectives and Approach

The primary objective of the EULR Study is to develop time-differentiated end use load shape data representative of residential end uses in the Northwest region, based on data from a sample of circuits in existing homes. Notionally, NEEA believes that this can be achieved by sampling approximately 400 homes taken across the region. For many homes, the 2016 RBSA will provide detailed descriptive information about the home's size, features, occupants, and electric end use equipment.

This research will enable accurate estimations of time-differentiated energy (kWh) and possible capacity (kW) savings (savings load shapes) when substituting more energy efficient electric technologies for baseline or status quo electric technologies. Additionally, it will facilitate better targeting of demand response programs; provide more accurate information for transmission and distribution planning; and enable more accurate load forecasting, revenue forecasting, and rate-making.

3.1 Geographic Scope and Sampling Approach

NEEA and Partners request that, given the sample size of 400 homes, bidders suggest a sampling approach that will offer the most representative load data for targeted end use equipment in single family, manufactured homes, and (eventually) multi-family residential homes of electric customers in Washington, Oregon, Idaho, and western Montana. NEEA and its Partners will work with the selected bidder to plan for multi-family metering, which is expected to delay multi-family metering until the second year.

NEEA encourages bidders to review the reports from the 2011 RBSA and 2012 RBSAM provided in Section 4.2 (Reports and Supporting Documents). NEEA believes the sampling methodologies utilized in the 2016 RBSA are adequate to serve as the base population for EULR Study sampling, though bidders are also invited to provide potential alternative approaches. If bidders wish to propose alternative approaches, they should fully address both the requests in this RFP and their proposed alternative.

Bidders should provide an approach that covers the Northwest Power and Conservation Council heating and cooling zone 1 and combines zones 2 and 3 (see "RTF Utility Climate Zone Designations," section 4.2) into the sample design to the extent feasible. Since end uses, not homes, are the subject of the research, it may be necessary to stratify the sampling in order to obtain sufficient representation of some end-use technologies. For example, the 2016 RBSA sample may not be sufficient to accurately characterize their load shape. Conversely, many of the sampled homes have only natural gas heating, which is outside the scope of the EULR Study; these homes should be screened from the sample, unless they contain targeted end use equipment such as central air conditioning.

3.2 Oversampling

In addition to the regional research, individual utilities may be interested in understanding

the end-use load shape data from the perspective of their own service territory or for some sub-regional combination of service territories. For these utilities, the bidder must provide a cost estimate for oversampling and analytical services in their service territory that would augment the larger, regional study. Bidders should include in their proposals a section that addresses estimated cost per home and per end use to the utility for oversampling and analytical services. NEEA prefers that utility partners wishing to augment sample sizes for their particular service territory work directly with the awarded Contractor.

3.3 Research Deliverables

The research deliverables for the EULR Study are as follows:

3.3.1 Data Sets and Database

1. Collect a minimum of five-minute interval data on current by circuit and both current and voltage by home from statistically representative samples of targeted electric end uses in the Northwest region's homes:
 - a. Targeted equipment includes time-differentiated load data from circuit metering of:
 - Ducted heat pumps
 - Ductless heat pumps
 - Heat pump water heaters
 - Electric forced air furnaces
 - Central air conditioners
 - Electric baseboard heaters
 - b. Bidders should plan to map and verify the correct circuit and meter all targeted end use equipment listed above. In addition, other identifiable end use equipment on its own circuit should also be metered. These are expected to include clothes washers, clothes dryers, electric resistance water heaters, and electric ranges. Circuits that do not have identifiable, individual equipment may be recorded as labeled. Up to 20 circuits per panel, plus the whole home service will be metered. Bidders should explain how they will map and verify circuit labeling on circuits with single end use equipment.
 - c. Bidders should propose approaches for collecting indoor and outdoor temperature and any other data needed to establish relationships between temperatures and temperature sensitive end uses to produce weather normalized load shapes.
 - d. Metering of current for circuits and both current and voltage of the whole home service drop is required.
 - e. Each year, the study should increase metering of end uses by 100 or more of each of the targeted end uses, with the metered sample growing to 400 metered homes by year five.

- f. Data collected for heat pumps should identify when the units are in heating mode or cooling mode. This may be accomplished by measuring vapor line temperature, or by other means proposed by the bidder.
2. Collect and quality assure five-minute (or less) interval data for indoor and outdoor temperature, synchronized with the interval circuit-metering data.
3. Create a database containing all of the data collected at each metered site:
 - a. The database should be clearly labeled and annotated, cleaned, and in a common data format. Bidders should explain their proposed quality assurance procedures to avoid missing values and how they propose to deal with missing or corrupted values.
 - b. Bidders should identify how metered data anomalies will be detected and metering performance issues corrected before data are lost.
 - c. The database will be augmented each year of the study with the previous year of metered circuit data.
 - d. All reported data must be anonymized. The detail non-anonymized data is considered confidential and the Contractor must implement controls to keep this data secure at all times, and in all forms, once it leaves the premise of where it was collected.
 - e. The EULR Study metered data should be coded to match to the appropriate RBSA descriptive data for the homes.
 - f. Prepare and deliver:
 - Regional coincident system peak day 1x24-hour generalized load shapes for metered end use equipment for both winter and summer.
 - Weekday 1x24-hour generalized load shapes in each month for metered end use equipment.
 - Confidence intervals for the 1x24 load shapes above.
 - 1x8,760 hourly (annual) data and generalized load shapes for metered end use equipment.
 - g. The generalized load shapes referred to above should be consistent with the methodology of the Regional Technical Forum (RTF) of the Northwest Power & Conservation Council (4.2 Regional Technical Forum tool). While bidders may propose different methodologies, using publicly-available RTF tools for constructing and viewing load shapes is recommended.
 - h. The quality assured and cleaned data will be delivered in a delimited format (pipe or comma) flat file.

4. Protecting the privacy of participating customers will be important. Data will be cleaned to remove any proprietary information or personally identifying information (PII). Proposals should include a description of bidders’ internal data security protocols. Laptop computers used in the field should not contain identifiable information.
5. Unless otherwise specified and agreed to, all data collected during the course of this study is the sole property of NEEA. The Contractor will have no right to use any data for any purpose outside the scope of this study without prior approval by NEEA.

3.3.2 Reporting and Presentations

1. Annual reports summarizing all findings developed for each end use, segmented where possible by heating and cooling zones, state, and residence type (e.g., single family, multi-family, or manufactured homes) are expected.
2. Bidders should assume five (5) presentation “events,” including one or more presentations to regional stakeholders regarding findings and their implications for energy efficiency efforts in the region.

4 Definitions and Applicable Documents

4.1 Definitions

Acronym / Term	Definition
Annual Load Shape	A graph of 8,760 hours of kilowatt-hour (kWh) electricity consumption by electric end use equipment.
End Use	For purposes of this RFP, the application for which an appliance or device is designed. For example, heating, air conditioning, ventilation, cooking, and water heating.
Equipment	Specific electric devices within an end use category. For example, ductless heat pumps, baseboard heaters, or heat pump water heaters.
EULR	End Use Load Research
High Rise Multi-family	Multi-family buildings with five floors or more
Low Rise Multi-family	Multi-family buildings with four floors or less
Load Shape	Graph of time-differentiated kWh consumption by end use equipment.
NEEA CEAC	NEEA Cost-effectiveness Advisory Committee
NEEA and Partners	Bonneville Power Administration, Clark County PUD, Energy Trust of Oregon, NEEA, Northwest Power and Conservation Council, Portland General Electric, Puget Sound Energy, Seattle City Light, Snohomish County PUD, and Tacoma Power
NEEA Project Manager	Point of contact for NEEA and Partners
NEEA RAC	NEEA Residential Advisory Committee
NILM	Non-intrusive load monitoring of the load from the whole home, then using statistical methods to disaggregate individual end use equipment.
NPCC	Northwest Power and Conservation Council
PII	Personally Identifying Information
Protocol	An agreed upon procedure or convention for how important details in the EULR Study will be managed.

RBSA	Residential Building Stock Assessment
RBSAM	Residential Building Stock Assessment – Metering Study
RTF	Regional Technical Forum of the Northwest Power & Conservation Council
Savings Load Shape	Graph of the time-differentiated kilowatt-hour (kWh) electricity savings from applying energy efficient equipment versus the standard equipment
Steering Committee	A committee of senior executives from each NEEA Partner organization who will oversee the EULR Study, approve project plans and budget, and have final decision authority on research project-related matters
Working Group	A committee of representatives from each NEEA Partner organization engaged in detailed project design and providing recommendations to the Steering Committee
UL Listed	Underwriters Laboratory listing is a U.S. certification, often required for electrical equipment in homes and businesses.

4.2 Reports and Supporting Documents

Title	Description & Link	Date
Northwest Heating and Cooling Zone Definitions: “RTF Utility Climate Zone Designations”	Public link from the Northwest Regional Technical Forum consisting of a spreadsheet with information associated with the “climate zone” definitions: https://nwcouncil.app.box.com/s/vz1j0hwaulan8g4olwck6q3stibnczu5	Most Current
Northwest Power & Conservation Council Seventh Power Plan	https://nwcouncil.org/energy/powerplan/7/plan/	Most Current
Master List of Residential End Uses	Public link from the Northwest Power and Conservation Council consisting of a spreadsheet with information associated with residential measures relevant to the development of the Seventh Power Plan: https://nwcouncil.box.com/s/ph0by9u53vygowx42rms5oytoihdmg5x	Most Current
RBSA Single Family Report: Single-Family Characteristics and Energy Use	Final report of the most recent (“2011 RBSA”) Single-Family segment http://neea.org/docs/reports/residential-building-stock-assessment-single-family-characteristics-and-energy-use.pdf?sfvrsn=8	10/31/2012
RBSA Manufactured Home Report: Manufactured Homes Characteristics and Energy Use	Final report of the most recent (“2011 RBSA”) Manufactured Homes segment http://neea.org/docs/default-source/reports/residential-building-stock-assessment--manufactured-homes-characteristics-and-energy-use.pdf?sfvrsn=8	2/14/2013

<p>RBSA Multi-family Home Report: Multi-Family Characteristics and Energy Use</p>	<p>Final report of the most recent ("2011 RBSA") Multi-Family segment http://neea.org/docs/default-source/reports/residential-building-stock-assessment--multi-family-characteristics-and-energy-use.pdf?sfvrsn=6</p>	<p>9/5/2013</p>
<p>NEEA Regional Data Resources (including the 2012 RBSAM)</p>	<p>Landing page of resources, including the publicly available data on NEEA studies of residential, commercial, and industrial building stock and metering data. http://neea.org/resource-center/regional-data-resources</p>	<p>10/31/2012</p>
<p>Regional Technical Forum Tool for Conversion of 8,760 hr. metered data to Generalized Load Shape format</p>	<p>This MS Excel tool is used to convert 8,760 hour raw data into the Regional Technical Forum's Generalized Load Shape (GLS) format. https://nwcouncil.app.box.com/s/9osbb86pgtc1hzhuaqxowyp4i4uvnzit</p>	<p>Most Current</p>

5 Project Phases

The EULR Study will have four distinct phases:

1. Sample Design and Work Plan Development with the Working Group
2. Recruitment and Pre-test of Equipment and Protocols
3. On-Site Metering, Database Development, and Quarterly Reporting
4. Analysis, Reporting, and Presentation of EULR Study Results

Proposals should identify the bidders' suggested approach and sampling methodology, activities, deliverables, timelines, and cost estimates for each phase.

5.1 Phase One

5.1.1 Sample Design and Work Plan Development

The awarded Contractor shall submit a draft Work Plan to be presented and discussed at a kick-off meeting. The Work Plan will describe each phase, including how the Contractor will proceed with the research, data collection, analysis, report preparation, and other proposed activities, as well as pre-testing associated with each phase. The Work Plan will consist of, but may not be limited to the following:

- Proposed methodology for sampling and sampling plan;
- Approaches to be used for each study phase;
- Schedule of the major tasks, including milestones and estimated completion dates;
- High-level outline of reports;
- Estimated hours and elapsed time required for each major task in each phase; and
- Party responsible for each task.

Bidders should note that part of the sampling plan potentially could include a decision to use existing data for a particular end use rather than targeting it in the metering sample. For example, there is a possibility that existing data may be a sufficiently representative load shape for ductless heat pumps (DHPs). Thus, it may not be necessary to target as many homes with DHPs in the metering sample. Bidders should propose (1) how they would assess whether existing data were sufficiently reliable and sufficiently representative and/or (2) how they might adjust existing data to ensure that it is more representative of the actual end use load shapes.

Data that includes ductless heat pumps from the 2012 RBSAM is available online at: <http://neea.org/resource-center/regional-data-resources>

5.1.2 Planning Sessions with Working Group

Bidders should be aware that an important task involved in the planning of EULR Study involves participating in or facilitation of Working Group and Steering Committee (Definitions, 4.1) sessions, and potentially other regional stakeholders. Bidders should note that NEEA is responsible for the outreach and initial engagement with regional parties in order to establish scheduling of Working Group sessions. NEEA wants bidders to understand the importance of these sessions and their contribution to the overall research.

NEEA and Partners envision an initial engagement process that will include three two-hour meetings with the Working Group, in which a draft Work Plan is presented in the first meeting and input is captured from Working Group members. Iterative meetings will be held to incorporate input/feedback and establish the final Work Plan and protocols.

5.1.3 Sample Design

A sampling methodology for end use metering is preferred that:

- Is representative of the Pacific Northwest in proportion to its population.
- Is representative of the heating and cooling zones in the Pacific Northwest. Bidders may consider whether modeling heating and cooling zones from sample data may partially substitute for a smaller sample size in areas with low population.
- Will allow inferences to be drawn for the following strata:
 - The Northwest region including all residential electric utility customers in Washington, Oregon, Idaho, and Western Montana (the BPA region with Northwestern Energy).
 - All residential electric utility customers in Oregon.
 - All residential electric utility customers in Washington.
 - All residential electric utility customers in Idaho.
 - All residential electric utility customers in western Montana (BPA region with Northwestern Energy).

NEEA and Partners are aware that limitations on the size of the sample and the project budget may affect the extent to which the above goals are achieved.

The awarded Contractor will deliver a memo which describes the final agreed upon sampling approach and details the sampling methodology and recruitment plans to be informed by the Working Group and Steering Committee engagement process as described above.

5.2 Phase Two

5.2.1 Study Recruitment

Bidders must recommend a methodology that uses the most appropriate survey method or combination of survey methods (mail, phone, email, etc.) to minimize sample bias and recruitment costs.

NEEA and Partners expect the project will rely on the 2017 RBSA as the primary sample frame, which includes approximately 1,200 homes. If circumstances arise where specific end uses are not common enough in the 2017 RBSA sample to achieve a desired degree of confidence in the load shape, there are other secondary data sources (such as utility surveys and end-use rebate databases) that can help to identify the homes with the targeted end uses. Under these circumstances, more extensive information may need to be collected on home characteristics, since they would not have been part of the RBSA. Bids should include two circumstances, one in which the entire sample can be drawn from residential building stock assessments (these occur in 2017 and 2021); and one where it is necessary to collect 30% of the metering sample from outside the RBSA sample each year, including information on the age of home, square footage, number of occupants, and the specific types of heating, ventilation, and air conditioning and water heating equipment, including the manufacturer and model numbers.

Some of this information may be collected by telephone and verified through on-site inspection if the home is selected for metering. Should a recruitment survey be implemented, it may serve to collect the needed information (including confirming the utility service provider) and as a logistical function providing an opportunity to execute participant releases for on-site installation.

Given the time required of homeowners or tenants to facilitate on-site visits, bidders should estimate an appropriate incentive and incorporate this cost into proposals. Past research incentives have typically ranged between \$100 and \$300 per home visit, depending upon the circumstances.

A strategy to address attrition of Study participation is important. Approximately 10 percent of utility customers may move in any given year; the ability to convince the new homeowner or tenant to continue participation in the Study may prove less expensive than having to remove the metering equipment and restart recruitment to replace customers who move. Reporting to the NEEA Project Manager and Working Group should include progress on recruitment efforts.

5.2.2 Technical Infrastructure, Design, Build Out, and Operation

The Contractor will work with NEEA's IT department to design and build out a technical infrastructure capable of accepting the data streams, validating and normalizing the data, and securely storing the data. It is the Contractor's responsibility to design, develop, and manage the technical infrastructure while ensuring NEEA's approval of design and general oversight. The Contractor will be expected to utilize technical best practices as they relate to technical design, database design, development, testing, and operational controls. NEEA becomes the exclusive owner of all aspects of the technical solution that do not leverage the Contractor's, or others', existing solutions. If the final solution builds on the Contractor's existing solutions,

NEEA will be given license to continue to modify or operate the solution after the contract period. NEEA prefers the technical solution will be built out on Microsoft Azure using NEEA's existing tenant, however, other platforms/solutions will be considered.

NEEA assumes the underlying database will be SQL Server. The database design must incorporate security controls to mask any PII from all but specific users. The Contractor will provide a detailed data dictionary which must be approved by NEEA. The Contractor will design and perform ongoing data quality measures to ensure the collected data is valid and adheres to the data dictionary specifications.

The Contractor will be responsible for managing and operating the technical infrastructure and will provide ongoing access to identified NEEA resources for general oversight and ad-hoc data analyses. Any data analysis performed by NEEA will be read-only. Any data corrections, summarizations, or other entry will be the responsibility of the Contractor.

5.2.3 Pre-Test of Study Protocols and Equipment

Bidders should identify the specific meters and equipment they propose to use for this Study (including technical specifications and capabilities and all direct costs of the meters, data storage, and communications equipment). Any metering or other equipment purchased to execute the EULR Study will be owned by NEEA. All meters and electrical equipment proposed to be installed must be UL listed. The Contractor will be responsible to remove meters and equipment upon the conclusion of the study. Proposals for non-intrusive load monitoring (NILM) and load disaggregation as the primary method for collection of end use load data will not be considered for this RFP. However, bidders wishing to propose NILM to augment this residential end use load metering study may do so. NEEA and its partners are interested to follow NILM developments in case it becomes an accurate and cost-effective method of end use data collection.

The awarded Contractor is expected to provide a test bed capable of demonstrating that all equipment, communications, data storage, and protocols work to the satisfaction of NEEA and Partners. Alternatively, this may be achieved by demonstrating that the Contractor has successfully used the same ensemble of data collection tools, software, and protocols in the past. Over the course of the 5-year project, the awarded Contractor is expected to consider newer, cheaper methods that improve metering options and/or data collection methods.

Bidders should also identify where the use of subcontractors (such as electricians) will be required during installation and include installation time required, and quality assurance methods for the installation.

5.3 Phase Three

5.3.1 On-Site Metering

The awarded Contractor will work with the NEEA Project Manager and the Working Group to determine the frequency that Contractor should provide sample disposition reports. These disposition reports should address progress of meter installations, as well as operational and non-operational installed meters.

Bidders should address the following questions in their proposals:

- What will be done to ensure the safety of Contractor staff, including subcontractors?
- What frequency protocols will be used to ensure meters are working properly, data are accurate, and the data are accurately transferred to the database?
- What protocols will be used to ensure that time intervals are consistent within a home and across homes (e.g. data are always recorded on the same 5-minute marks)?
- How will the customer’s privacy and safety be protected? For example, staff entering a customer’s home should be clearly identifiable to the customer and have had a background check prior to beginning work on the premises.
- NEEA and its Partners are seeking metering of electric current to the circuits, but also are interested in being able to calculate the power factor for the home. Bids should identify the cost of metering current only and the incremental cost of metering current and voltage, so that the cost of achieving a power factor measurement can be considered.
- Bids should be constructed based upon an assumption of a 90-minute average visit to the homes for meter installation and circuit mapping.

5.4 Phase Four

5.4.1 Analysis, Presentations and Updates

The awarded Contractor will conduct analysis of metered data on an annual basis, identifying descriptive statistics, measures of volume and quality of data collected, including load shapes for targeted end uses/technologies, as agreed to by the Working Group. The awarded Contractor should anticipate presenting findings to regional stakeholders on an as-needed basis. NEEA suggests bidders assume at a minimum four (4) presentations associated with findings and implications of EULR results.

Additionally, the Contractor will need to provide weekly status updates to NEEA’s Project Manager as well as coordinate with NEEA to provide regular status updates to the Working Group via monthly conference calls.

Summary of Minimum Update Requirements	
Update Required	Timeline
To Project Manager	Weekly
To Working Group	Monthly/Quarterly
To NEEA and Partners	(Approx. 5) Annually

The appropriate method of communication for these updates is described above and/or available for discussion with the Project Manager.

5.4.2 Reporting

The EULR Study will include the delivery of two annual reports including: 1) a report identifying and discussing lessons learned and recommendations for the following year; and 2) an energy analysis report on the current year’s data. The energy analysis report

should include characterization of the end use load shapes by measure (see 3.3.1, 3e), any impacts of new data additions, peak demand and average energy, the degree of variance around peak demand and average energy, and a discussion of the implications of reliance upon the load shape for measuring peak and energy savings.

A report outline for both reports shall be submitted to the NEEA Project Manager prior to drafting the report. These outlines should serve as a basis for discussion between the Contractor and the Project Manager to ensure that both parties agree to the report structure and content. To the extent possible, NEEA will make an effort to provide an opportunity for input from the Working Group.

Reports must be provided in draft form to NEEA Project Manager. This draft will be reviewed and commented on by NEEA staff, the Working Group and any other parties deemed appropriate by NEEA. Based on these comments, the contractor shall make revisions and deliver to NEEA a final version of the report.

Bidders should allow for additional requests that may be needed to support the EULR Study and incorporate a line item for such costs in their annual cost estimates. These requests would most likely include development of interim memos or white papers. NEEA will consider contract modifications to the extent these work products are outside the original scope.

6 Research Timeline

Note that the first year of metering and analysis described in this solicitation (including presentations of year 1 results) should be completed no later than June 2019. Bidders should provide their approach to completing the work according to the following prescribed timeline associated with each major phase.

Estimated End Use Load Research Timeline for Year One				
Phase	Study Component	Deliverable	Start Date	End Date
1	Project Planning, Stakeholder Facilitation, Sample Design	Final Study Protocols and Work Plan.	October 2017	December 2017
2	Recruitment and Pre-test of Equipment and Study Protocols (if needed)	Initial 100 homes recruited	December 2017	February 2018
3	Metering and Database Development	Meter installations and data monitoring	February 2018	February 2019
4	Analysis, Reporting, and Presentations	Year 1 Database & Reports		June 2019
		Final Presentation (Year 1)		Q3 2019

Note on Scheduling: Timelines for initial recruitment and on-site metering should avoid scheduling of installations during the holiday season (approximately November 15 through January 5). NEEA and Partners expect that the four phases and timelines described above will be repeated on an annual cycle through the year 2021. The final project timeline will be determined in consultation with NEEA and Partners as part of Phase 1 in the first year.

7 Contractor Competencies and Qualifications

NEEA encourages proposal submissions from qualified contractors or teams of contractors with a proven track record of collaboration.

7.1 Marketing

Bidders should be aware that there are marketing aspects of the EULR Study that may require partnering with or subcontracting to another vendor in order to facilitate recruitment efforts. Proposals should indicate if the bidders have sufficient marketing capability within their own organization to deliver specified marketing services or indicate if the bidder intends to team with a secondary contractor. In either case, proposals should demonstrate sufficient marketing capability and experience.

7.1.1 Introductory Materials

The successful Contractor will be responsible for the design and development of all participant-facing materials including but not limited to: introductory letters; FAQs or similar collateral seeking to provide general information about the study; all third party releases; and other collateral deemed necessary and requiring presentment to EULR Study participants.

7.1.2 General Marketing Services

As part of the EULR Study, NEEA envisions the ability to raise market awareness about the project at the regional level or through our utility partners to drive the participant response rates. Bidders should anticipate that marketing efforts shall be conducted over the course of the Study. Where these efforts can be coordinated with recruitment, they should be geography-specific and coordinated with the appropriate utility partners.

7.1.3 Coordination / Recruitment and On-Site Assessment

The successful Contractor will also be responsible for coordination of any subcontractors, including any call center or direct mail marketer utilized for recruitment of Study participants. These duties include coordination during the recruitment phase to receive lists of prospective respondents for whom to distribute introductory letters and informational collateral, information regarding the on-site assessment, thank you letters and incentive payments upon installation of meters, and coordination/scheduling of site visits to install metering equipment.

7.2 Data Security

In the aggregate, metering data will provide significant value to the Northwest and NEEA expects this information to be widely used by NEEA's partners. However, specific personally identifiable information (PII) is highly confidential and its disclosure (intentionally or otherwise) could have significant implications to NEEA and Partners. Bidders should provide examples of how they have kept similar data confidential in the past and how they

propose to keep PII aspects of the collected data secure.

7.3 Technical Expertise

The successful Contractor should be well qualified in the following areas:

- Sample Design / Development of Sampling Plans
- Experience in Recruitment of Metering Participants
- Data Collection Design and Development
- Experience Conducting Residential Energy Metering
- Capabilities/Experience in Analysis of Energy End Use Data
- Experience in technical data collection, database design, system development
- Experience/Expertise in Database Design and Implementation
- Experience in Developing Publication-Quality Reports

7.4 Collaboration with Utilities

NEEA will take the lead on all activities that involve NEEA-funder cooperation and coordination; the awarded Contractor will maintain a support role unless otherwise directed.

The successful Contractor should understand sensitivities of the utility industry and the regulatory environment in which they operate. The NEEA Project Manager should be notified of which customers are being metered and the respective utility service area.

The awarded contractor will be expected to resolve study participant (utility customer) complaints quickly and effectively. Any disagreements or issues with study participants should be promptly reported to the NEEA Project Manager and communicated to the appropriate Working Group representative of the utility of the customer in question.

8 Stakeholder Engagement

A study of this magnitude will require significant coordination with regional utilities. Bidders should consider the time required to coordinate with NEEA and utilities and any other needed coordination, as well as providing a plan to ensure that coordination occurs in a timely manner. Bidders must describe their intended methods of project management and utility coordination to ensure smooth execution of data collection and collaboration among all relevant stakeholders. Working Group members will identify appropriate points of contact for their organizations.

Engagement with stakeholders during the planning phase of the EULR, prior to fielding, would involve incorporating input into final protocols. As appropriate, test bed results and recommendations for any potential changes to study protocols based on these results will be shared with Working Group members and additional feedback may be sought. Once modifications are made and metering begins, NEEA envisions the level of engagement to be primarily focused on information sharing (including regular – monthly – updates on progress, written and by conference call) with some potential for input depending on potential issues that may arise during the course of fieldwork.

9 Proposal Submission

Bidders shall submit (1) electronic copy of the Proposal according to the RFP schedule

below.

9.1 Planned RFP Schedule (May be Subject to Change)

Date Due	Time Due	Item
August 21, 2017	5 pm	RFP posted
August 31, 2017	5 pm	Intent to Respond submitted to NEEA (MANDATORY)
September 5, 2017	5 pm	Bidder questions submitted to NEEA
September 7, 2017	10-11am	Bidders Conference (MANDATORY)
September 21, 2017	5 pm	Written proposals due to NEEA
September 25-28, 2017	5 pm	Selection of Finalists
September 29- October 6, 2017	5 pm	Finalist Oral Presentations
October 10, 2017	5 pm	Finalist chosen and contacted
October 10-31, 2017	5 pm	Contract Negotiations
November 1-22, 2017	5 pm	Contract Set-up, Execution, Holiday
November 30, 2017	5 pm	Estimated Work Start Date

9.2 Intent to Respond (REQUIRED)

All “Intent to Respond” forms (see Appendix A) must be received as directed in the RFP Schedule. Firms that submit an Intent to Respond form are under no obligation to submit a proposal. Only those parties submitting the “Intent to Respond” form will be provided with updates to the RFP, have questions responded to, and have their proposals considered.

NEEA strongly encourages firms that believe they have the capabilities and qualifications to conduct any or all of the scope described in Section 5 to submit an Intent to Respond form.

9.3 RFP Point of Contact

All correspondence, included but not limited to, questions and submissions shall be directed to:

David Clement, Senior Economist
Northwest Energy Efficiency Alliance
421 SW 6th Avenue, Suite 600
Portland, OR 97204
Phone: 503-688-5476
Email: dclement@neea.org

9.4 Question & Answer Webinar (REQUIRED)

A webinar or telephone conference is **tentatively** scheduled for Thursday, September 7, 2017 from 10:00 am-11:00am PST. The Q&A webinar is mandatory for all entities submitting an “Intent to Respond” as described above. Entities submitting an Intent to Respond are free to delegate responsibility for attendance to anyone within their organization, but NEEA expects at least one representative in attendance.

Webinar and audio log-on information and conference agenda will be provided to individuals as indicated on the Intent to Respond form following the proposal submission deadline. NEEA

will attempt to provide answers to questions during this event, but may allow additional questions to be asked and submitted by email if needed. Answers to written questions will be sent to all respondents.

9.5 Proposal Format

Bidders should note that proposals MUST adhere to the page limits noted below; core proposals must be no longer than 36 pages (not including the Appendix) and include the following components:

1. **Executive Summary (2-page maximum)** – Include the key strategies and approach to executing the EULR Study, proposed costs, and the reasons NEEA should select your team.
2. **Introduction (3-page maximum)** – State your understanding of the scope and key objectives of this project.
3. **Project Team Identification (4-page maximum)** – Provide information regarding the proposed project team, including hierarchical team structure. Note that project team bios and/or resumes should be included in the Appendix section.
4. **Proposed Methodology/Approach (12-page maximum)** – Provide information regarding the specific methodologies and approach to be undertaken to complete the EULR Study.
5. **Timeline (6-page maximum)** – Provide the proposed timeline for all major phases and milestones of the project broken out by proposed task and associated deliverables.
6. **Project Cost (6-page maximum)** – Provide the cost estimate for each phase of the project (as described in Section 5) by proposed task outlined in the proposal timeline. A breakout of any direct costs and an hourly rate sheet should be included the Proposal Appendix. General format should be a cost matrix whereby tasks are “rows”, and contributors are identified in “columns”.
7. **Technical Infrastructure Solution and Data Security (3-page maximum)** – Provide an overview of your anticipated technical solution, including if your solution assumes real-time or batch data feeds, process of transferring data from monitoring devices to the database, how the data is kept secure during this transfer, how you deal with data transfer interruptions, estimated database size, conceptual design of the back-end infrastructure, backup/recovery, data security controls, and other relevant information.

Cost estimates for on-site metering should be proposed, with direct cost estimates (for meters and equipment) itemized separately. In addition, bids should be presented on a not-to-exceed cost per home metered and should include an itemization of the following costs:

- a) The additional cost per home to include voltage in metering each whole home service.
- b) The additional cost per home to include indoor temperature monitoring in all homes metered.
- c) The additional cost per home to include outdoor temperature monitoring in all homes metered. Please identify whether this is based upon collecting data

- from outdoor equipment or from an external weather service.
- d) The additional cost per home to include time-differentiated woodstove usage monitoring in homes that have woodstoves as a secondary heat source. Customers who identify wood heat as their primary heat source (wood stove or fireplace) should be pre-screened from the study. Secondary heating sources can significantly alter electric heating load shapes, in ways that may be difficult to identify without direct metering of them.
 - e) The additional cost per home to meter end uses in high rise (5 floors or more) multi-family homes. Multi-family with 4 floors or less are expected to be already included in the project.
 - f) The additional (not-to-exceed) cost per home for NEEA Partners who want to increase the sample size within their own service area beyond what would otherwise occur within the scope of this project.
8. **Proposal Appendix** – Appendix materials do not count against the 36-page maximum and should include the following:
- Hourly Rate Sheet - for all proposed project team members including estimated hours by Task and any projected annual hourly rate increases.
 - Company Background & Qualifications
 - Project Team Bios – Include information about program team members and team structure, past team efforts on similar work, years of experience and other relevant qualifications.

10 Selection Process

10.1 Term of Contract

The project will be executed over a period of five years. However, on an annual basis, NEEA retains the right to continue project work for the subsequent one-year period based on an evaluation of the performance of the awarded Contractor(s). Responding bidders should note that the Working Group made up of representatives of NEEA and its Partners will be central to the evaluation process, reviewing all responses to this solicitation and recommending the finalists.

10.2 Scoring

Bidding firms will be rated in terms of the following:

1. Responsiveness to the RFP and demonstrated understanding of the issues surrounding the project.
2. The thoughtfulness and appropriateness of the proposed methodology used to accomplish the desired results of the project.
3. The experience and qualifications of the individuals specifically proposed to execute and manage the project. (Note: Proposed staffing is a significant factor in bidder selection. As such, no changes in key staff/substitutions or changes in roles/responsibilities can be made without the written agreement of the NEEA Project Manager).
4. The experience of the firm or team of firms making the proposal.
5. The experience of the firm's project manager and/or the project management team.
6. The capability to execute the plan, including past experience and aptitude for collaboration.

7. The cost of the work envisioned under this solicitation should be bid as described in Section 5.

NEEA is under no obligation to select any proposal that results from this solicitation, nor is there any obligation or intent implied to reimburse any party for the cost of preparing a proposal in response to this RFP. NEEA encourages bidders to submit proposals that include innovative methods or tasks in addition to or different from those listed in the RFP; however, these should be listed as additional “options” over and above the scope envisioned in this solicitation to facilitate comparisons between competing proposals.

11 Insurance/Warranties

Without limiting any liabilities or any other obligations of the Contractor, the Contractor shall, prior to commencing work, secure and continuously carry with insurers having an A-rating (or better) from A.M. Best Company the following minimum insurance coverage:

11.1 Commercial General Liability Insurance

With a minimum single limit of \$1,000,000. The coverage shall include:

1. Bodily Injury and Property Damage Liability;
2. Contractual Liability;
3. Products and Completed Operations to protect against and from all loss by reason of injury to persons or damage to property, including all third persons, and property of NEEA and all third parties based upon or arising out of Contractor's operations hereunder, including the operations of its subcontractors of any tier.

11.2 Business Automobile Liability Insurance

With a minimum single limit of \$1,000,000 for bodily injury and property damage with respect to Contractor's vehicles, whether owned, hired or non-owned, assigned to, or used in the performance of the Tasks.

Appendix A – Intent to Respond Form

RFP #: **50335**

Project Title: End Use Load Research Study

NEEA Point of Contact: David Clement, dclement@neea.org

PLEASE PRINT:

Company	
Address	
City, State, Zip	
Contact Name	
Contact Title	
Phone #	
Fax #	
E-mail	

The company named above intends to submit a proposal in response to NEEA’s request for proposal listed above.

Deadline for submitting the “Intent to Respond” form is end of business day of date listed in the RFP schedule.

Signature of Authorized Representative _____

Print

Name _____

Title _____

Date _____