Energy Trust of Oregon
Request for Proposals:
Resource Assessment
Emerging Technology
Measure Characterization

RFP Submission Deadline:
August 21st, 2017

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Energy Trust of Oregon

Introduction

Energy Trust of Oregon (Energy Trust) is seeking proposals for qualifications and pricing to develop emerging energy efficiency technology 'measure characterizations' for use in Energy Trust's Resource Assessment model (RA model). Measure characterizations are assumptions needed to model resource potential from energy efficiency measures (more detail provided later). Energy Trust seeks to add ten distinct emerging tech measures to its current RA model to reflect new practices or efficiency measures that may provide cost-effective energy savings sometime over the next 20 years, but that are not commercially available today. Measure characterizations for these emerging tech measures will be used to forecast future energy efficiency resource potential in order to establish policies and set program targets for energy efficiency resource acquisition.

1.0 Energy Trust Background

Energy Trust is an independent nonprofit organization, selected and overseen by the Oregon Public Utility Commission, to lead Oregon ratepayers in benefiting from saving energy and generating renewable energy. Our services, cash incentives, and solutions have helped participating customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas save over $5.6 billion on their energy bills. The cumulative impact of our leadership since 2002 has been a contributing factor in our region's low energy costs and in building a sustainable energy future. More information about Energy Trust's background, funding sources, strategic and action plans, policies and programs are available on our website at www.energytrust.org/about.

2.0 Resource Assessment Background

Energy Trust uses a Resource Assessment (RA model), sometimes referred to as a conservation potential model, to support utility Integrated Resource Planning (IRP) processes and also to inform internal program planning. Energy Trust's RA model is built in the *Analytica* software program. It generates information about the magnitude and cost of technical, achievable, and cost-effective achievable energy efficiency resources available in Energy Trust's service territory over a 20-year planning horizon for each of the five utilities that Energy Trust serves.

Energy Trust's RA model contains two distinct components:- 1) A base resource assessment that considers technologies that are commercially available today, and 2) An emerging technology assessment designed to quantify the likely magnitude of savings and cost of new technologies that are not yet ready for energy efficiency programs. Emerging Technologies are technologies that are not yet mass-produced, reliable or widely available, or where savings are not yet firmly established, or are not yet cost-effective, but are likely to meet all these criteria at some point. The emerging technology assessment provides an estimate of the likely magnitude of savings and cost of new technologies, as well as a reasonable range of timing of when emerging technologies will become available. A key feature of the methodology used for modeling emerging tech measures is the use of a risk factor adjustment, which is described on page 11 in the Resource Assessment report

linked below. Respondents should familiarize themselves with the approach Energy Trust uses for Emerging Technologies using that report linked below.

Currently, Energy Trust includes 33 distinct Emerging Tech measures that together make up between 15-20% of cumulative cost-effective achievable potential from 2017-2034. The purpose of this work is to develop emerging technology measure characterizations, to add to the 33 emerging tech measures already included in Energy Trust's model.

More details and information about Energy Trust's RA model, including the approach used for modeling resource potential from Emerging Technologies, can be found in the report at the following link;
http://assets.energytrust.org/api/assets/reports/Energy_Efficiency__Resource_Assessment_Report.pdf

3.0 Study Scope

Energy Trust seeks a qualified independent contractor to develop distinct measure characterizations (as defined above) for each of the following list of emerging technologies, for use in Energy Trust's Resource Assessment model;

3.1- List of emerging technology measures for which measure characterizations are to be developed

1. Commercial- Rooftop HVAC Dedicated Outdoor Air Systems (DOAS)
    a. Separate measures and two efficiency tiers needed for each Heating, Cooling, Ventilation
2. Commercial- High-efficiency circulation pumps
3. Industrial- Engineered compressed air nozzles
4. Residential- Heat pump water heaters (next generation)
5. Residential- Behavior (beyond the level incorporated as a firm resource in Energy Trust's current resource assessment)
6. Residential- *Next Step* new homes[1]
7. Commercial- Path to Net Zero buildings[2]
8. Commercial- Dynamic Glass and Secondary Glazing
9. Residential- Window attachments

[1] "Next step" refers to a NEEA test program to develop templates for efficient new homes that establish the bounds of feasible cost-effectiveness by achieving economies through system integration. NEEA is likely to transition this product into a market transformation initiative within the next year.
http://neea.org/initiatives/residential/efficient-homes

[2] Path to Net Zero refers to an Energy Trust program path for advanced new buildings to achieve significant savings above code. Some achieve net zero status while others do not.
https://www.energytrust.org/commercial/new-buildings-path-to-net-zero/ https://www.energytrust.org/wp-content/uploads/2016/12/121204_PTNZ_Report.pdf

10. Residential- Heat pump dryers

Energy Trust recognizes that these technologies have varying levels of probability of becoming commercially available and cost-effective. We crafted the measure list above to include technologies that have experienced some success but have uncertainties about the breadth of application (e.g., path to net zero buildings and next step homes) and technologies where we do not know of a mass replicable cost-effective approach (e.g., residential behavior at higher levels of savings).

The contractor selected for this work will develop distinct *measure characterizations* for each of the efficiency measures listed above. Each measure characterization is required to contain the following set of variables;

3.2- List of required measure characterization variables/inputs

1. **Unique Measure Name**
2. **Heating Zone Applicability**- Specification of the weather zone to which the measure is applicable. Most measures are applicable to both zone 1 and zone 2.
3. **Measure Description**- Detailed description of the efficient measure, including efficacy level.
4. **Baseline Technology Assumption**- Specification of the base measure being replaced, including efficacy level.
5. **End Use Category**- Input to map a measure to an end-use category such as space heating and cooling, water heating, lighting, appliance, refrigeration, weatherization, behavioral, and other.
6. **Customer Segment**- customer group or market segment where the measure is applicable.
7. **Replacement Type**- characterization of the measure as a retrofit (RET), replace-on-burnout (ROB), or a new construction (NEW) application.
8. **Scaling Basis**- – Input to identify the unit basis for density values (i.e. per residential home, per 1,000 sqft building space, per unit of load) .
9. **Unit Basis**- basis for cost and savings characterization (e.g., per oven, per clothes washer, per sqft of insulation).
10. **Baseline Measure Life**, in years.
11. **Efficient Measure Life**, in years.
12. **Baseline Measure Cost** (real 2017 $ per unit basis)
13. **Efficient Measure Cost** (real 2017 $ per unit basis)
14. **Baseline Electric Consumption**, in kWh per unit basis.
15. **Efficient Electric Consumption**, in kWh per unit basis.

16. **Electric Savings Load shape**[3]- The relevant electricity savings load shape of the efficient measure. The load shape is used to allocate energy savings across time.
17. **Baseline natural gas consumption**, in therms per unit basis.
18. **Efficient natural gas consumption**, in therms per unit basis.
19. **Gas Savings Load shape**- The relevant gas savings load shape of the efficient measure. The load shape is used to allocate energy savings across time.
20. **O&M Savings and Non-Energy Benefit**
21. **Savings and Cost Sources-** Documentation of the data source(s) for savings and cost assumptions.
22. **Measure Density-** The measure density (e.g., quantity of measures per home), as the sum of the base and efficient technology densities.
23. **Density/Applicability Source(s)-** Documentation of the data source(s) for density and applicability factors.
24. **Technical Suitability-** The fraction of the total baseline measure which could be replaced with the efficient measure.
25. **Baseline Saturation-** The initial saturation of the baseline measure as defined by the fraction of the end-use stock that has the baseline measure installed.
26. **Heating Fuel Type Applicability-** Designation of the appropriate space heating fuel type (electric only, gas only, or both).
27. **DHW Heating Fuel Type Applicability -** Designation of the appropriate water heating fuel type (electric only, gas only, or both).
28. **Competition Group-** Identifier of measures that are competing for the same installation. Measures in the same competition group share the same baseline technology; therefore, the baseline initial saturation and total measure density are the same for measures in the same competition group. More information about the approach used for competing measures can be found in section 2.2 of Energy Trust's RA Model report[4].
29. **Emerging Technology Risk Factor-** Multiplier to account for emerging technology risk. More information available on page 11 of Energy Trust's RA model report.

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[3] Energy Trust employs a limited set of Electric and Natural Gas load shapes that have been vetted by the NWPCC in their 7th Power Plan. The contractor selected for this work will be expected to specify the most appropriate load profile for both gas and electricity savings from the set of load profiles Energy Trust currently use. The contractor will not be expected to conduct original load research to inform these variables. If there is not an appropriate load profile within the currently employed set of load profiles, the contractor will be expected to recommend an appropriate course of action.

[4] https://www.energytrust.org/wp-content/uploads/2016/12/Energy_Efficiency__Resource_Assessment_Report.pdf

The contractor selected for this work will conduct research and/or analysis to develop appropriate values for each of the variables listed in *3.2* above, for each of the distinct measures listed in *3.1* above.

Furthermore, each measure listed in *3.1* may be applicable to multiple *customer segments*. In those cases, separate measure 'variants' are required to define the measure characterization variables listed in *3.2* above for each applicable customer segment.

The customer segments defined in Energy Trust's RA model, each of which requires a distinct measure variant (where applicable), are listed below;

Industrial Sector Customer Segments	Commercial Sector Customer Segments	Residential Sector Customer Segments
Agriculture	College	Single Family
Chemicals	Grocery	Multifamily
Cold Storage	Hospital	Manufactured Homes
Metal Foundries	Lodging	
Food Products	Office	
Hi Tech	Other	
Pulp & Paper	Other Health	
Metal Fab	Restaurant	
Transportation and Equipment	Retail	
Wood Products	School	
Other	Streetlights	
	Warehouse	

In addition, for each emerging technology measure in *3.1* above, the contactor will estimate time series profiles for the 20 years from 2018-2037, for each of the following input variables;

3.3- List of required measure time-series variables

1. **Market Availability Profile**- Value used to identify whether a product is commercially available (a value of 0 indicates not commercially available; a value of 1 indicates that it is commercially available).
2. **Energy Consumption Multiplier**- Value that adjusts the efficient technology energy consumption over time to reflect changes due to technology improvement.
3. **Cost Multiplier**- Value that adjusts the efficient technology cost over time due to predicted declines in technology cost.

4.0 Data Sources

Primary responsibility for sourcing data and assumptions required for the measure analyses will belong to the contractor. Energy Trust is not interested in funding significant primary data collection activities through this contract; the focus should be on existing data.

Supplemental data that is available from Energy Trust includes;

- Energy Trust program activity data at the measure level, including measure volumes and number of sites served[5], for certain measures and sectors
- Current emerging technology measure characterization spreadsheets

Other recommended data sources that should be considered by the contractor include;

- U.S. Department of Energy (DOE) Building Technologies Prioritization Tool
- USDOE R&D reports
- USDOE appliance standards analyses
- NEEA Emerging Technology Initiative
- NW Power and Conservation Council (NWPCC) and Regional Technical Forum (RTF)
- New Buildings Institute

5.0 Deliverables

This section describes the project's major deliverables. In addition to the major deliverables listed in 5.1 below, we expect that there will be extensive coordination and communication between Energy Trust and the contractor over the course of this project[6].

1. Kick-off meeting (in person or webinar)

2. Bi-weekly updates, sent via email, describing project progress since the last update and progress towards major project deliverables

3. Draft measure analyses, in the form of excel *measure characterization spreadsheets*, including draft values for required measure variables listed in *3.2* above

4. Meeting and presentation (in person or webinar) to describe draft results and resolve any Energy Trust questions and/or concerns

[5] Available program data varies by measure. Residential retail program measure data, for example, contains almost no information about the number of sites served with those measures, or the geography of sites served. Programs where Energy Trust contractors directly serve customers to propose and install measures have more information.

[6] This includes, but is not limited to; reviewing draft analyses and major assumptions, check-in phone calls to quickly answer clarifying questions, data requests of Energy Trust to inform measure assumptions, and regular coordination/communication in general.

5. Final measure analyses, in the form of excel *measure characterization spreadsheets*, which include;
    a. In-tact measure analysis calculations
    b. Clear documentation of data sources (links to data or data itself) and assumptions employed for each measure listed in *3.1* above
    c. Written description and/or explanations of nuanced calculations, and/or analysis approaches, as requested by Energy Trust
6. Recommendations for future Emerging Technology measure improvements, including identifying current areas of high-uncertainty

6.0 Proposal Requirements

Proposal Structure
Respondent should include the following in a submitted proposal:

1. Short discussion of understanding of the services sought by Energy Trust through this RFP (no more than 1 page)
2. Proposed approach, including proposed methods for estimating future savings potential for each measure listed in *3.1*, and proposed data sources (no more than 2 pages)
3. Work plan, timeline, and description of deliverables (no more than three pages)
4. Price proposal, including job titles and hourly rates for resources proposed for this project
5. Qualifications and experience of the team pertinent to this particular piece of work? (no more than one page)
6. Resumes of each person who will be performing work under the resulting contract. Personnel who are proposed will be the actual contract performers. No personnel substitution may be made without prior Energy Trust approval.

Conflict of Interest Disclosure
Respondents should disclose any direct or indirect, actual or potential conflicts of interest Respondents may have with Energy Trust in submitted proposals. A "direct or indirect conflict" is defined as any situation in which an individual or a member of their family or close business or personal acquaintance, is employed by Energy Trust or the Oregon Public Utility Commission, or may be reasonably construed to have a direct or indirect personal or financial interest in any business affairs of Energy Trust, whether because of a proposed contract or transaction to which Energy Trust may be a party or may be interested or is under consideration, or whether such conflict is purely conceptual, because of similarity of business interests or affairs. If no such conflict exists, the proposal will explicitly provide such a statement in their RFP response. The determination of whether a conflict of interest exists is left to the sole discretion of Energy Trust.

7.0 Proposal selection criteria

Proposals will be evaluated on the following criteria, and any other factors deemed relevant by Energy Trust:

Elimination criteria: (proposals must be minimally acceptable in these respects in order to be considered)

- Comprehension of the scope
- Price
- Commitment to meet schedule
- Proposed work addresses RFP requirements

Ranking criteria:

- Qualifications of the team 25%
- Understanding of the project and proposed methods/data sources 50%
- Price 25%

8.0 Schedule and Administration of Proposal Selection Process

RFP Schedule

Item	Date
Release of RFP	8/3/2017
Deadline for questions	8/11/2017
Energy Trust response to questions emailed	8/16/2017
Proposals due	8/21/2017
Successful firm notified	8/25/2017
Contract finalized	8/30/2017
Kick-off meeting, project work commences	8/30/17 - 9/1/17
Draft results and analysis due	9/25/2017
Meeting to discuss draft results	9/29/17 - 10/4/17
Final results and analysis due	10/16/2017

Responses must be submitted to Energy Trust by the submission deadline indicated in the table above.

Responses and questions should be sent to;

Adam Shick
Sr. Planning Project Manager
adam.shick@energytrust.org

An email confirming the receipt of your response will be sent within three business days of receipt.

Any questions and/or requests for clarification or additional information regarding this RFP must be submitted in writing, via email, to adam.shick@energytrust.org by the date indicated in the schedule above. Questions received prior to the stated deadline will be answered as indicated in the RFQ Schedule. Energy Trust cannot accommodate individual phone, mail, or fax inquiries about the RFP. All questions must be submitted via email.

9.0 RFP Governing Provisions

1. **Agreement to All Terms:** By submitting a response to this RFP, respondent represents that it is authorized to submit a response, all information provided in the response is true and correct, and respondent explicitly agrees to and accepts the following provisions of this RFP and all other terms and conditions set forth in this RFP.

2. **Right to Accept or Reject:** This RFP is not an agreement to purchase goods or services. Energy Trust is not bound to enter into a contract with any qualified respondent. Energy Trust reserves the right to modify the terms of this RFP at any time in its sole discretion. This includes the right to cancel or revise this RFP at any time. Further, Energy Trust reserves the right to waive any nonconformity in submissions received, to accept or reject any or all of the items in the submission, and award any ultimate contract in whole or in part as it is deemed in Energy Trust's best interest. No verbal agreement or conversation made or had at any time with any officer, agent, or employee of Energy Trust, nor any oral representation by such party shall add to, detract from, affect or modify the terms of the RFP, unless specifically included in a written addendum to this RFP issued by Energy Trust. In addition to any other enumerated reserved rights and/or options as stated in this RFP, Energy Trust may, in its sole discretion, do any one or more of the following:
    - Determine which responses are eligible for consideration in response to this RFP.
    - Disqualify responses that do not meet the requirements.
    - Negotiate with respondents to amend any response.
    - Select and negotiate and/or enter into agreements with respondents who are most responsive to the RFP and whose responses best satisfy the interests of Energy Trust and not necessarily on the basis of pricing alone or any other single factor.
    - Issue additional subsequent solicitations for qualifications, including withdrawing this RFP at any time and/or issuing a new RFP that would supersede and replace this one.
    - Vary any timetable or schedule, add and/or change any provisions

discussed herein.
- Conduct any briefing session or further RFP process on any terms and conditions.
- Suspend or modify the RFP process at any time.
- Enter into relationships with more than one respondent.

3. **Ownership of Responses:** All materials submitted in response to this RFP shall become the property of Energy Trust and shall not be returned to the respondent.

4. **Confidentiality:** Respondent shall clearly identify those proprietary portions of their responses that it does not want revealed to third parties and label such portions as "Confidential Information." Except as required under Energy Trust policy, law or for regulatory purposes Energy Trust will maintain confidentiality of such information.

5. **Respondent Expenses:** Respondent is solely responsible for its own expenses in preparing a response and for any subsequent negotiations. Energy Trust will not be liable to any respondent for any claims, whether for costs or damages incurred by the respondent in preparing the response, loss of anticipated profit in connection with any final contract, or any other matter whatsoever.

6. **Waiver of Claims:** Respondent waives any right it may have to bring any claim, whether in damages or equity, against Energy Trust, Energy Trust Board of Directors or any of Energy Trust's agents, employees or contractors, with respect to any matter arising out of any process associated with this RFP.

7. **Criminal Record and Credit Check:** Respondents selected as finalists to this RFP may be required to consent to a combined criminal record and credit check in order to proceed in the process. Energy Trust will obtain the respondent's consent to proceed with these checks.

8. **Resulting Contract:** The selected respondent(s) would be required to execute a written contract with Energy Trust to perform the services described in this RFP. No award will be considered a commitment, and no obligations or legal relations shall exist between Energy Trust and any selected respondent until a final and binding written contract has been executed by and between Energy Trust and such selected respondent. Key terms in any resulting contract would include the following: timely and accurate invoicing requirements, intellectual property provisions, conflict of interest disclosure requirements, confidential information nondisclosure requirements, indemnification for third party claims and limitation of liability provisions, and insurance requirements. Time is of the essence and prolonged contract negotiations will not be undertaken. In general, Energy Trust strongly prefers contracts that are consistent with Energy Trust's standard terms and conditions; negotiations for such contracts can generally be completed quickly. In some cases, a few terms and conditions may need to be substituted or waived, in accordance with contract negotiations. Any party involved in these contract discussions can terminate negotiations at any time and for any reason. If it appears that contract negotiations are not proceeding in a timely manner, Energy Trust may opt to terminate the discussions and select another respondent.