SOLAR MARKET RESEARCH FINAL REPORT

February 4, 2015

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Executive Summary

Energy Trust of Oregon contracted with Cadmus in March 2014 to research the current market for its residential solar electric program to better understand the decline in participation in recent years and to make meaningful, actionable recommendations for improvement. This report describes Cadmus' findings, conclusions, and recommendations and is intended to inform Energy Trust's future program marketing planning, strategies, and activities.

Despite early growth in Energy Trust's residential solar electric program and in solar installations in comparable markets and nationwide, Energy Trust saw participation in its program decline in 2012 and 2013. This research seeks to suggest ways to increase program participation, particularly through assessing and improving customer outreach and marketing efforts.

Cadmus worked with Energy Trust to identify four major research areas for the evaluation—customer awareness, customer motivations and barriers, marketing preferences, and demographics. In collaboration with Energy Trust, we developed detailed research questions for these topic areas. We reviewed program materials and marketing collateral, conducted interviews with Energy Trust and Solar Oregon staff, surveyed program participants and event attendees using a web-based survey, and conducted interviews with some of the survey participants. Based on findings from our market research, we present conclusions and recommendations here.

The most common way in which solar-installing customers first learned about Energy Trust's solar incentive was through a contractor. This indicates that Energy Trust's solar trade allies are often the first point of contact for interested customers. Cadmus recommends that Energy Trust continue conducting regular follow-ups with trade ally contractors to ensure that they are aware of Energy Trust resources and share them with customers. We also recommend holding a contractor focus group to better understand any challenges or barriers in promoting the residential solar electric program to customers and to identify potential opportunities and interest for collaborative marketing.

Some customers learned about the Energy Trust solar incentives through a family member, friend, co-worker, or neighbor. Cadmus recommends considering a "refer a friend" promotion to encourage more program participants to share information about the Energy Trust solar incentive with others. This could be executed digitally or through collateral. Customers could receive an e-mail after participating in the program with a "forward to a friend" link, or customers could receive several postcards in the mail after participation, which they could mail or give to a friend.

The pros and cons of purchasing versus leasing a system were cited as information helpful in making decisions about solar. Although this information is presented in the Solar Oregon "Basics of Going Solar" workshop, it is not prominently featured in the Energy Trust and Solar Oregon websites. We recommend Energy Trust consider incorporating on its webpages an easily accessible discussion of the pros and cons of purchasing and leasing a system to assist customers in making their decision.

Event attendees (who did not proceed with installation) were often unwilling to move forward with an installation because of the high upfront cost, concerns about reasonable payback periods, or because of site limitations such as shading. This underscores the need to continue to clearly address these concerns during the workshop. It is possible that event attendees who said they received disadvantageous payback periods did not have a well-suited site for solar. Energy Trust could ensure that information on anticipated cost savings and payback times continue to be clearly communicated during workshops and provide customers with appropriate case studies. Energy Trust could also emphasize the lease option or loans to offset the upfront costs.

We also recommend considering alternatives to point-of-use installations, such as community shared solar, sometimes called community solar gardens, where a larger scale solar array is constructed on well-suited available land, and multiple participants buy-in to the array and proportionately benefit from the energy produced. Alternatives would allow customers who are interested in solar but do not have well-suited homes to participate and benefit.

Energy Trust can improve its marketing collateral to provide clear actionable next steps for interested customers. Some marketing materials inform customers about the benefits of solar and provide them with information on how to participate, but they do not actively encourage the customer to take the next step toward visiting the Energy Trust website or reaching out to a contractor for a cost estimate. We recommend that all collateral have clear calls-to-action that provide a customer with the next step toward program participation.

Several other conclusions from the market research were:

- The Energy Trust website and an Internet search were the second and third most frequently cited sources through which purchase customers learned about the Energy Trust programs and were the second and sixth most frequently cited for lease customers.
- Some purchase interviewees stated receiving a realistic cost estimate was critical to give them the confidence to take the next steps in the installation process. They also felt it was necessary to do background research before contacting a solar trade ally for a site visit and cost estimate, which delayed getting the critical information they were ultimately looking for.
- The most prevalent advice among program participants and event attendees to others considering solar was to take action now and to install the system before incentives are no longer available or are not as lucrative. Cadmus recommends testing this message through a focus group.
- Challenges cited among customers who have participated in the program were limited; however, the few stated were related to upfront costs or technical aspects of installation (e.g., issues with roof, tree shade, inspections).
- Many program participants said the ease of maintaining the systems was a benefit of the system. Energy Trust could use this as a selling point in marketing and outreach content. This may also be useful information for customers who are weighing the pros and cons of leasing versus purchasing a system.

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MEMO

Date: March 19, 2015
To: Board of Directors
From: Sarah Castor, Evaluation Sr. Project Manager
Lizzie Rubado, Sr. Project Manager - Solar
Subject: Staff response to the Residential Solar Market Research project

The purpose of this market research project was to get an updated view of the market for residential solar electric systems; the last market research Energy Trust commissioned on this market took place in 2008. Since that time, many changes have occurred in the market, including a substantial decline in prices for solar panels, a number of community bulk solar purchases, the introduction of the state's volumetric incentive rate program (also known as the feed-in tariff) and the growth of third-party-owned solar systems. In conducting this research, Energy Trust was looking to understand what resources and tools best assist customers in making the decision to install a solar electric system, what factors lead customers to buy or lease a system, and what barriers prevent some customers from installing a solar system.

Based on the findings and recommendations from this research, Energy Trust sees the following opportunities:

- Greater promotion of tools like the solar calculator and Mapdwell; customers reported that the solar calculator provided important financial information needed to make a decision about installing solar
- Update marketing materials to have a clearer call to action and provide more sense of urgency, and make changes to the website to make resources, like customer testimonials and example projects, easier to find
- Continue research into, and efforts to reduce, soft costs for solar contractors
- Work with the Oregon Department of Energy to make the tax credit process easier for solar customers
- Provide more information about solar leases, loans and Power Purchase Agreements (PPAs) to enable customers to make the best decision for their circumstances
- Ensure Energy Trust is a top result in web searches about solar within Oregon

The research pointed to the success of existing channels to educate prospective customers about going solar and the resources provided to support decision-making. Energy Trust solar trade allies were identified as the most common way that customers learned about Energy Trust solar incentives. Energy Trust's website was also frequently cited as a resource used by customers to learn about Energy Trust solar offerings.

Solar program and marketing staff will utilize this research to inform future program plans.

Introduction

Energy Trust of Oregon contracted with Cadmus in March 2014 to research the solar market related to its residential solar electric program and to make meaningful, actionable recommendations for improvement. The program's stated mission is to create a vigorous and sustainable market for solar in Oregon that ultimately can thrive without incentives. There are also goals set and revised on a 5-year basis through Energy Trust's strategic planning, and goals set internally on an annual basis, such as total solar capacity installed for both commercial and residential solar. The program was launched in 2003, but in 2012 through 2013, program participation declined and Energy Trust wants to know how its marketing efforts can be used to increase participation. This report describes Cadmus' findings, conclusions, and recommendations and is intended to support Energy Trust's future program marketing planning, strategies, and activities.

Cadmus worked with Energy Trust staff to identify four major research areas for the evaluation—customer awareness, customer motivations and barriers, marketing preferences, and demographics. In collaboration with Energy Trust, Cadmus prepared research questions and developed research activities for each of these areas.

To address the research questions, Cadmus reviewed program materials and marketing collateral, conducted interviews with Energy Trust and Solar Oregon staff, surveyed a selection of residential solar electric program participants and event attendees using a web-based survey, and interviewed some survey participants by phone.

Cadmus' market research was intended to meet these outcomes:

- Obtain intelligence and feedback about the technical and financial information solar program participants find critical for their decision-making process
- Identify ways to enhance and improve Energy Trust's solar PV program marketing strategies to achieve greater participation

Research tasks are listed here and described more fully in the Methodology section:

- Design and conduct interviews with program stakeholders
- Review and assess program materials
- Conduct online surveys with partial[1] and full solar program participants
- Conduct in-depth follow-up interviews with full and partial solar program participants
- Analysis and reporting

[1] Event attendees are considered the partial participants group—they have engaged with Energy Trust or Solar Oregon at a workshop or event but have not gone through with an installation.

Table 1 on pages 6 and 7 lists the key research areas, the research questions covered under each area, and the research activities we carried out under this project.

Program Overview

Energy Trust's residential solar electric program offers funding to reduce the upfront cost of installing a qualified home solar electric system. The amount of funding, or incentive, depends on the size of the solar electric system installed and the customer's electric utility. The incentive is applied as a discount on the invoice at the time of purchase and reduces the amount the customer pays the contractor. Once the project is completed, Energy Trust verifies proper installation and reimburses the contractor for the discount. Incentives provided by Energy Trust can be paired with other available state and federal incentives, significantly reducing the cost to install a solar electric system.

Energy Trust advertises the solar electric program through various media such as radio ads, e-mail, printed materials and more. As part of the program, Energy Trust collaborates with Solar Oregon, a nonprofit agency contracted by Energy Trust to provide outreach and education on solar and its applications, and to conduct solar workshops that help interested homeowners understand the basics of solar and provide information about available incentives and additional resources. Energy Trust and Solar Oregon sponsor other solar-related events such as Solar Drinks, where Oregonians can meet and network with other solar enthusiasts and professionals. Energy Trust also maintains a database of program-qualified solar trade allies that interested homeowners can contact to learn more about opportunities for installing solar at their homes and obtain site assessments and cost estimates.

Ownership Methods

There are currently two ways that homeowners acquire solar. A homeowner can hire a contractor to install a system that the homeowner then owns. Or, a homeowner can lease a system, or just purchase the electricity from a system, that is owned by a third-party company. For this analysis, we grouped program participants by these two types of system ownership—either direct or third-party. This is a decision that must be made prior to the system installation, and it can have significant financial impacts for the parties involved.

Direct-Ownership

A direct-ownership customer, also referred to in this report as a "purchase" customer, chooses to buy the solar electric system outright from the solar installer, which typically requires a large upfront payment or a loan. The customer then owns the system from the first day of installation and receives the full benefit of all electricity generated and any rebates, tax credits, and environmental attributes such as renewable energy certificates (REC). The customer is also responsible for any maintenance of the system during its useful life, though the solar equipment comes with 10-25 year warranties, and contractors include a minimum two-year workmanship warranty on the installation.

Third-Party Ownership

A third-party system customer, also referred to in this report as a "lease" customer, does not own the solar array on their property. The system is owned by an entity other than the homeowner; this entity installs and leases the system to the homeowner for a fixed monthly fee for the life of the lease, usually 20 years, and the homeowner benefits from all electricity generated by the array. Another variation of this type of ownership is called a power purchase agreement (PPA); where the third-party owner sells the homeowner all of the electricity (in kWh) generated by the solar array for the life of the contract. The price the homeowner pays for each kWh depends on the terms of the PPA, but typically escalates annually at an agreed rate established at the outset of the contract. Because the homeowner does not own the solar array, this method allows the homeowners to go solar with little or no upfront cost.

Under third-party ownership, the homeowner benefits from the electricity produced, which is typically sold by the third party at a lower price than the homeowner would pay the utility, thus creating immediate and ongoing cost savings for the homeowner. Because the homeowners do not own the system, however, they do not directly benefit from available incentives. Instead, the third party generally receives all associated incentives and passes some of these benefits to the homeowner by lowering the lease payment or PPA rate. The third-party owner is responsible for operation and any maintenance necessary to the system during the life of the contract.

Program Incentives

Since launching its solar electric program in 2003, Energy Trust has offered incentives to program participants to reduce the cost of solar installations. Typically, incentives are offered based on the solar array's capacity, in dollars per watt ($/W) installed, with a cap on the maximum incentive award. Early in the program, incentives for eligible systems were as high as $4.25/W, and they have steadily declined to their current state of $0.70/W up to $7,000 for direct-ownership Pacific Power customers and $0.95/W up to $9,500 for direct-ownership Portland General Electric customers.

Incentives for third-party owned systems are managed separately to allow the program to respond to the different economics and market conditions for leased systems, and are currently $0.70/W up to $5,000 for third-party owned projects in Portland General Electric and Pacific Power territory.

To qualify for Energy Trust's incentives, the customer and the solar array must meet these criteria:

- Must be an Oregon customer of Portland General Electric or Pacific Power.
- Systems must be installed by an approved Energy Trust solar trade ally contractor.
- Incentive applications must be approved by Energy Trust prior to installation.
- Solar arrays must be grid-tied and net-metered.
- All system components must be new.
- Solar installation must meet Energy Trust's Solar Electric Installation Requirements
- Additions to existing solar electric systems are allowed but may be subject to incentive caps.

Program participants are also eligible for other state and federal tax credits that can further reduce the cost of the solar array.

Methodology

As described in the Introduction, Cadmus met with Energy Trust early in the project to define the areas and desired outcomes of its market research. These are:

- Obtain intelligence and feedback about the technical and financial information solar program participants find critical for their decision-making process; and
- Identify ways to enhance and improve Energy Trust's solar PV program marketing strategies to increase participation.

Cadmus and Energy Trust developed the detailed research questions and activities described in Table 1.

Table 1. Proposed Market Research Areas, Research Questions, and Corresponding Activities

Research Questions	Research Activities
Research Area: Customer Demographics	
What are the demographics of customers who attended a Solar Oregon workshop or event, directly purchased a PV system in the past 18 months, or leased a PV system in the past 18 months: • Household income, education, housing characteristics, length of time they considered solar For Solar Oregon workshop or event attendees: • Did they install solar after the workshop? If not, do they plan to? When?	Review of program materials, analysis of existing market research and survey reports, survey and interview data
Research Area: Customer Motivators	
For all customers: • What do they see as the top three benefits of solar? For customers who directly purchased a system in the past 18 months: • What motivated them to proceed with an installation when they did? What were their primary reasons for installing solar? • Did they consider a lease or power purchase agreement (PPA) option, and if so, why did they opt to purchase their system? For customers who leased a system in the past 18 months: • What motivated them to proceed with an installation when they did? What were their primary reasons for installing solar? • Did they consider purchasing the system and owning it, and if so, why did they opt to lease?	Review of program materials, analysis of existing market research and survey reports, survey and interview data

Research Questions	Research Activities
Research Area: Challenges and Barriers	
For all customers: • What do customers see as the top three barriers to installing solar at their home? For customers who directly purchased a system in the past 18 months: • What was easy/difficult about getting solar installed? For customers who leased a system in the past 18 months: • What was easy/difficult about getting solar installed?	Review of program materials, analysis of existing market research and survey reports, survey and interview data
Research Area: Marketing Preferences	
For all customers: • From what sources have they found information about solar PV? • What information or assistance would be most valuable in helping customers decide to install solar? • What tools would be most helpful to helping them decide to install solar? • How would customers prefer to receive basic information about solar? • Who do customers trust to give them the most useful information about solar? For customers who attended a Solar Oregon workshop or event: • How valuable did they find the information they received from the interaction? • What information or assistance do they most want or need to help them install solar? • Would they have gotten the same or more benefit from the information if it had been delivered through a different format? If so, what format (e.g., website, online videos, printed materials, etc.)?	Review of program materials, analysis of existing market research and survey reports, survey and interview data
Research Area: Awareness	
For customers who directly purchased a system in the past 18 months: • Was there anything customers wish they had known about installing solar that they know now? For customers who leased a system in the past 18 months: • How aware are customers of Energy Trust and Energy Trust incentives for solar? • Was there anything customers wish they had known about installing solar that they know now?	Review of program materials, analysis of existing market research and survey reports, survey data (participating customers)

Program Materials Review

Cadmus worked with Energy Trust to gather and conduct a review of important program documents, including marketing plans, outreach materials, metrics tracking methods, and recaps of marketing activities. This review supported our development of stakeholder and customer interview guides and the web-based participant survey.

The program and marketing materials review and report involved these activities:

- Assess the messaging and clarity of marketing materials, and the materials' ability to support program target achievements
- Identify potential barriers and/or opportunities for improvement of marketing materials and content
- Provide comparisons with and insight into industry best practice approaches, where possible

Program Stakeholders Interviews

Cadmus conducted interviews with staff and key advisors—two Energy Trust staff members and two Solar Oregon staff members—to explore the following topics:

- Program staff roles and responsibilities
- Program logic, strategy, and delivery
- Outreach plans and strategies
- Target audiences for the various program components
- Barriers to program participation and approaches to overcome those barriers
- Program successes and challenges as well as areas of improvement
- Areas for improvement, particularly marketing and training

Surveys and Interviews with Program Participants and Event Attendees

Conduct Online Surveys

Cadmus developed and implemented a web-based survey for customers in Energy Trust's and Solar Oregon's databases. We drew a sample from the customer databases provided, using the sampling plan detailed below. Research activities focused on three subsets of customers, as shown in Table 2.

Table 2. Customer Definitions

Customer Type	Description	Source of Contact Information
Event attendees	Residential "Basics of Going Solar" workshop participants and Solar Drinks (an event where community members can meet others in the area who support renewable energy) participants between December 1, 2012 and May 10, 2014	Solar Oregon customer database
Lease model participants	Participants who lease their solar electric system or purchase the electricity through a PPA with the solar service provider and are listed as having an install date for their system between December 1, 2012 and April 21, 2014	Energy Trust customer database
Purchase model participants	Participants who have purchased and installed eligible solar electric systems between December 1, 2012 and April 21, 2014	Energy Trust customer database

We tailored the survey to each customer type and addressed the following topics:

- How they learned about the solar program
- Marketing content and outreach channel preferences
- Actions taken since event attendance
- Factors that influenced participation (and type of participation, i.e., lease or own) or nonparticipation
- Satisfaction levels with the program overall and key elements, including marketing and education
- Motivators and barriers
- Demographic and household characteristics
- Awareness of other Energy Trust programs
- Willingness to participate in follow-up interview (given a $50 incentive)

To support a high response rate, we designed the web-based survey so it could be completed within 10 to 12 minutes. We worked with Energy Trust to craft and send advance e-mail notices of the survey, cross-referencing the e-mail addresses and removing lease model and ownership model participants from the event attendee list to avoid contacting people multiple times. The ownership and lease model participants were asked if they attended a workshop or event and the same subset of workshop/event satisfaction questions as the event attendees.

We set up a single survey and determined the groups by e-mail list and by how they answered certain qualifying questions in the survey (as noted, removing lease and ownership participants if they were also in the event attendees category).

Event attendees are considered the "partial participants" group—they have engaged with Energy Trust or Solar Oregon at a workshop or event but have not gone through with an installation. We asked them

if they took any further action that we were not yet aware of—are they installing solar and have they received an incentive (and if so, from whom)? We categorized these partial participants by their responses to qualifying questions and cross-referenced the results with the customer databases.

We followed Dr. Don Dillman's Total Design Method (TDM),[2] a comprehensive design and implementation approach routinely used at Cadmus to produce highly valid data, using these key TDM aspects for web surveys: making participation convenient and brief with focused questions; personalizing all contacts with respondents; sending a token of appreciation ($25 gift card) after survey completion; and using multiple contacts, prompts, and follow-ups. We used Qualtrics, an online survey firm, to administer the surveys. Surveys requested that customers indicate their willingness to participate in a follow-up interview.

Survey Sampling

We sampled program participants and event attendees who have been active with the program within approximately the previous 18 months, defining this period by the solar electric system install date for both ownership and lease model participants and the date of participation at a workshop or event for partial participants. For each group, we aimed for a 90% confidence with a 10% precision; we used a census of eligible participants from each group to increase the confidence and precision. Table 3 shows the confidence and precision levels, population, dates for the sampling frame, and the final sample size for participant group.

Table 3. Confidence/Precision Level and Sample Size by Participant Group

Group	C/P	Population (N) [1]	Sampling Frame Dates	Survey Completes
Lease model participants	90/9	728	12/1/2012 – 4/21/2014	72
Ownership model participants	90/10	393	12/1/2012 – 4/21/2014	82
Event attendees (workshop participants and event attendees)	90/11	416	12/1/2012 – 5/10/2014	50[2,3]

[1] The population sizes have been updated from those reported in the Work Plan, dated July 2, 2014. Duplicate participant names were removed from the listserv provided, lowering total population figures.

[2] The sample size for the event attendees group was lower than the number of completes necessary to draw a 90/10 confidence/precision level of statistical significance. The error rate in drawing conclusions about the population based on this sample size is 11%.

[3] The number of survey completes for the event attendee population was adjusted to 50 in the second draft of this report after Cadmus found that four (4) respondents had incorrectly been categorized as event-only participants. At the start of the survey, these 4 customers responded that they had attended a workshop or event, but had not completed an installation. However, they later noted in the survey that they had indeed completed installations, making them program participants, not event-only participants (event attendees). Because the respondents did not identify whether they were lease or purchase participants, Cadmus did not re-categorize them to either group, but instead removed their responses from the survey data.

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[2] Dillman, Don A., Jolene D. Smyth, and Leah Melani Christian. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method.* Wiley and Sons, 2009.

Conduct Follow-Up Interviews with Program Participants and Event Attendees

Cadmus conducted ten (n=10) follow-up telephone interviews with survey respondents in each of the participant and partial-participant groups (n=30 overall). For each group, phone interviewees were randomly selected from lists of survey respondents who indicated they would be willing to conduct a follow-up interview. Interviewees were offered a $50 incentive for their cooperation. We customized the interview guides for each category, designing them so that interviews were completed within 30 minutes. Questions were open-ended and allowed us to ask more specific questions about the customers' research and decision-making process than could be revealed in the survey results.

Our interviewers had specific questions to raise in the interviews, but they were also prepared to adapt their questions and ask follow-up questions in response to information and project context to encourage interviewees to expand on relevant issues.

Findings

This section presents detailed study findings drawn from program stakeholder interviews, program materials review, customer online surveys, and customer follow-up surveys. Because each research task contributes findings to multiple research areas, we have grouped our findings by research area.

Customer Awareness

Program Responsibilities

Energy Trust offers incentives to residential customers for the installation of solar electric systems and conducts direct outreach, such as event tabling, to prospective program participants, generally through its website and at informational workshops and events staffed by Solar Oregon. Energy Trust also spreads awareness of the program through print and radio ads and cross promotions with other Energy Trust programs.

Solar Oregon is contracted by Energy Trust to provide outreach and educational support for the solar program. It delivers workshops to educate residential customers about the technical and financial aspects of solar electric systems. Solar Oregon provides customers with information on all available options for installing solar (direct ownership, lease, PPA) and the incentives, tax credits, and loan products available. Solar Oregon also staffs booths at conferences and events throughout the state to raise awareness of the Energy Trust program.

To coordinate efforts, Energy Trust conducts in-person meetings or calls with Solar Oregon once a month and communicates via e-mail for lower priority activities. Staff members discuss upcoming marketing and outreach activities and update workshop content, as necessary. Solar Oregon sends Energy Trust monthly invoices and a spreadsheet of workshops held and a list of attendees.

Energy Trust has a network of trade allies who are qualified to install solar electric systems and knowledgeable about Energy Trust's requirements and procedures (a customer must contract within this network in order to be to be eligible for an incentive). Energy Trust requires these trade allies to participate in online training that focuses on installation standards, program processes and requirements for incentives. This training does not emphasize customer service or marketing. Energy Trust provides co-operative marketing reimbursement and some marketing collateral to trade allies, and is open to the idea of sharing more marketing tactics with interested trade allies.

Sources for Learning about Energy Trust's Solar Incentive

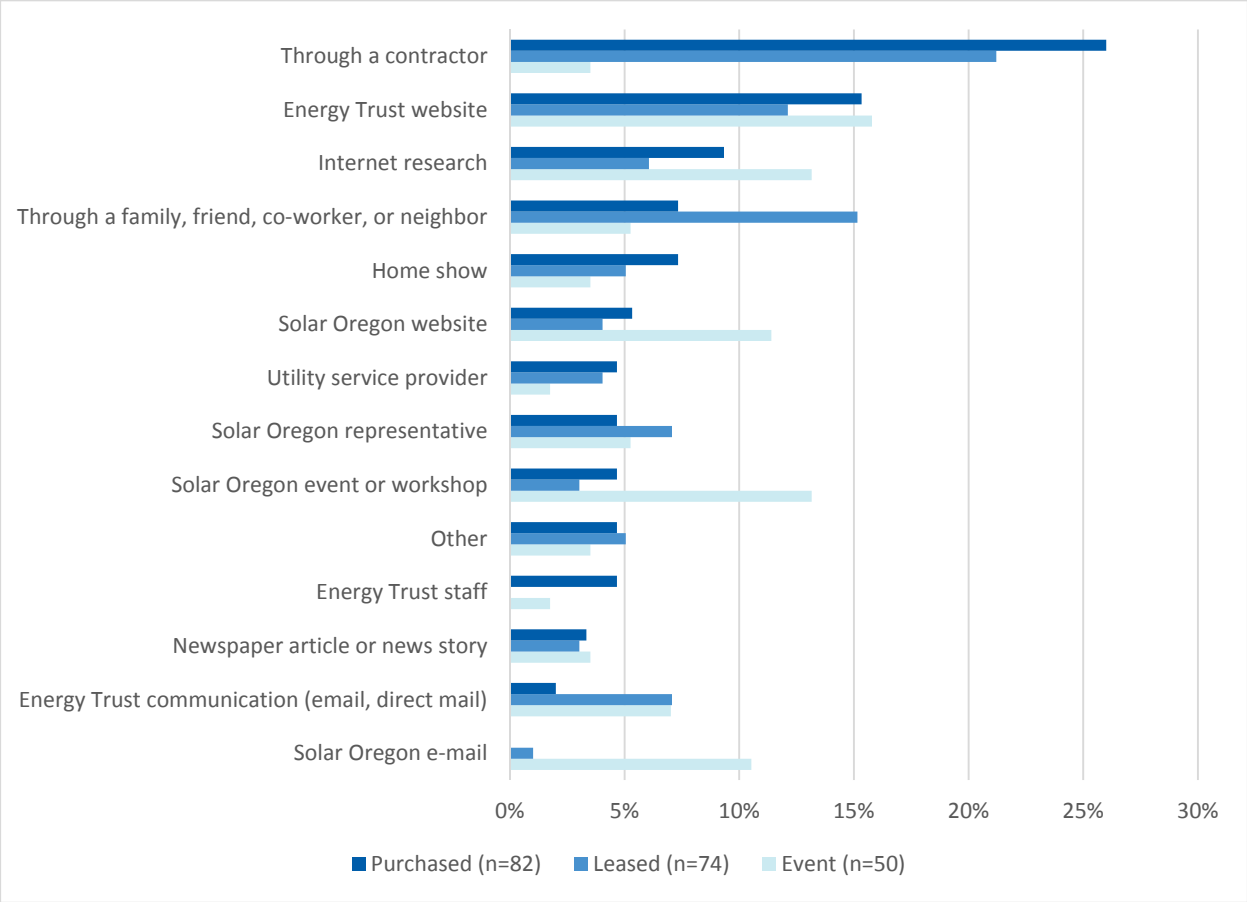
Among all survey respondents, the most common ways they first learned about Energy Trust's solar incentive were through a contractor (15% of responses), the Energy Trust website (14%), through Internet research (10%), and through a family member, friend, co-worker, or neighbor (9%).

Customers who purchased their systems first learned about Energy Trust's solar incentive through a contractor (26% of responses), the Energy Trust website (15%), and through an internet search (9%).

Customers who leased their systems first learned about Energy Trust's solar incentive through a family member/acquaintance (15% of responses), through the Energy Trust website (12%), and through Solar City, a trade ally that installs many third party systems (12%).

Event attendees first learned about Energy Trust's solar incentive through the Energy Trust website (16%), by Internet search (13%), and through a Solar Oregon event or workshop (13%). Figure 1 shows how the three groups first heard about Energy Trust's solar incentive.

Figure 1. How Respondents First Heard of Energy Trust of Oregon's Solar Incentive



Source: Energy Trust Solar Market Research Online Survey Question: F1. Multiple responses allowed.

In comparing these, we note that survey respondents who purchased or leased more often heard of the program through a contractor or leasing company, acquaintance or the Energy Trust website; those who had not yet installed a system more often heard of the program through a Solar Oregon event, website, or internet research. This indicates that program participants may have decided to install solar before hearing of the program, or they were made aware of the program by their installer and then went to the website to learn more or verify the installer's information.

Awareness of Incentives

Among customers who leased their systems, 78% of respondents said they were aware of the incentives for solar. Among those who purchased, 91% were aware of the incentives for solar.

During follow-up interviews, many respondents that had chosen to purchase their solar electric system said that contractors often explained the incentives available from Energy Trust and from state and federal agencies. Contractors often gave customers a breakdown of the financial impacts of the incentives on the cost of the solar array.

Among lease participants, 83% of respondents noted that incentives were very important in their decision to install solar, followed by 16% who said it was somewhat important.

Marketing Preferences

The program's marketing and outreach goals are to raise customer awareness of solar electric systems, their value, and the available incentives, and to connect interested customers with a trade ally to obtain a proposal and move forward with an installation. Energy Trust's marketing has generally been sporadic and often reactionary because no extensive marketing was needed early in the program given its high demand. Now, however, Energy Trust is interested in developing more strategic, proactive marketing for sustained visibility, awareness, and participation in the program, and to help decrease the cost to contractors of acquiring customers.

In addition to conducting workshops and tabling events, Solar Oregon is responsible for monthly newsletters, a weekly e-mail blast, and letters to the editor to publicize the Energy Trust solar program. Solar Oregon organizes the annual Solar Now! University campaign, in which it conducts outreach to nonprofit organizations, municipalities, counties, and other parties interested in solar and encourages people who have already installed a system to talk about their experiences. All Solar Now! University materials are Energy Trust-branded. According to Solar Oregon, case studies and testimonials presented through Solar Now! University have been a useful marketing tactic in driving customer participation. Solar Oregon sometimes co-hosts events with Energy Trust trade allies in specific regions and helps contractors file for incentives or register systems.

Marketing Materials

To learn about Energy Trust's marketing efforts, Cadmus reviewed its "Solar Now" brochure, the "Basics of Going Solar" workshop presentation (developed by, and branded as, Solar Oregon), and advertisements ("Why Go Solar" and "Solar Leaf") to understand the messaging, clarity of information and call-to-action to the customer, and ultimately the materials' ability to support the program's marketing goals. Cadmus rated the clarity of information and the call-to-action on the scale of 1 to 5 in which 1 is "very unclear" and 5 is "very clear."

We organized our findings from the materials review in Table 4.

Table 4. Material Review of Marketing and Outreach Collateral

Materials Reviewed				
Item	**Messaging/Content**	**Clarity of Inform-ation**	**Clarity of Call-to-Action**	**Notes**
"Why Go Solar" Infographic	• Customers should go solar because cities in Oregon are sunny, solar has gotten cheaper, there are many trade allies available, less space is required for solar to make an impact on your electricity bill than ever before.	5	1	Relays positive benefits of solar, but does not include a clear call-to-action that pushes customer to install solar or to visit a website for more information.
"Solar Leaf" Print Ad	• Solar uses natural energy • Energy Trust can help you go solar • Solar will help you save on energy bills	5	3	Establishes Energy Trust as a trusted advisor that can assist customers on the path to installing solar, but does not actively encourage customers to install solar.
"Solar Now" Brochure	• Benefits of solar • "Solar 101"; steps to installing solar • Costs of solar; tax credits and incentives available • Choosing a solar contractor	5	5	Provides much information on the basics of solar electric systems, tax credits, and incentives. Does not discuss impact on electricity bill nor return on investment (ROI)/ estimated payback time.
"Basics of Going Solar" Presentation	• Benefits of solar • Technical elements of solar electric systems • Costs, different incentives and tax credits • Ownership options	5	5	Provides thorough, basic explanation of solar technologies and available incentives and tax credits.

The messaging for most of the materials focus on the benefits of going solar—solar is a clean and renewable source of energy and there are multiple financial incentives available to defray the costs of installation. There is a brief mention of the impact of solar energy on one's energy bill in the print ad and more coverage of this in the presentation; however, this impact is not covered in the other two pieces of collateral.

The content in the marketing materials is largely clear and easily understandable.

While a clear call-to-action is present in the brochure and the presentation, it is missing from the infographic and the print ad. In the infographic in particular, there is no call-to-action that encourages the customer with a "next step"; the piece is informative but not actionable. Similarly, the print ad informs the customers about the benefits of solar, but does not actively encourage the customer to participate in the Energy Trust program.

Program Challenges and Areas for Improvement

According to program stakeholders, there has been little aggressive marketing of the program done in the last few years because strong program participation and limited incentive funds did not merit additional marketing. Program stakeholders are now interested in developing more consistent marketing efforts with thoughtful messaging that encourages customer participation. Energy Trust is also interested in dedicating more efforts to social media as well as online and mobile marketing.

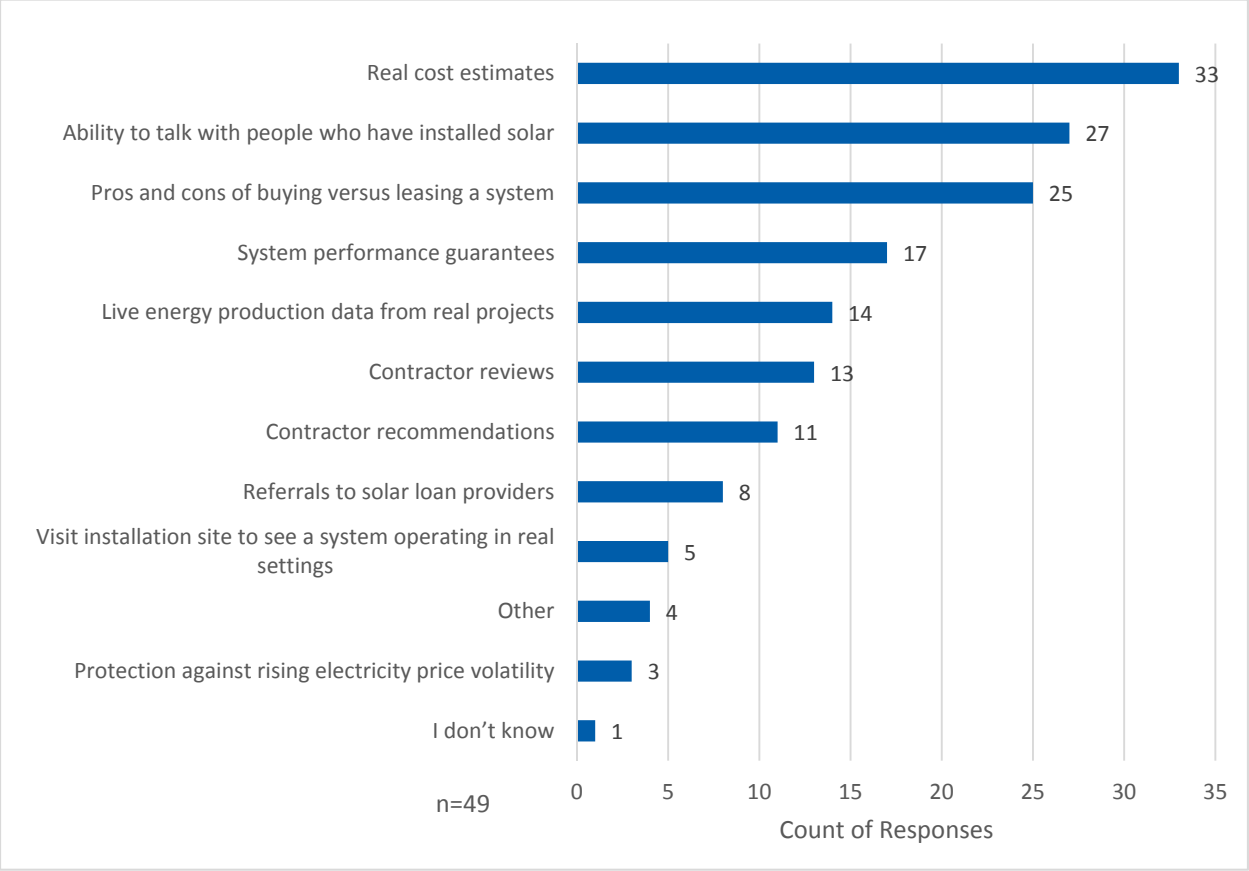
Helpful Information and Resources for Event Attendees

When event attendees were asked about the types of information or assistance that would be most valuable for making decisions regarding solar, they cited factual cost estimates, conversations with people who have installed solar, and understanding the pros and cons of buying versus leasing a system. Figure 2 shows the most valuable types of information or assistance for making a decision about installing a solar electric system.

When asked what type of online tools would be most helpful for making decisions regarding solar, event attendees said they wanted a calculator that, in order of preference, estimates the cost of installing solar, estimates the incentives and tax credits for installing solar, and shows estimated yearly savings (Figure 3). These capabilities are available in Energy Trust's Solar Calculator on its website; however, more than half of the event attendees who participated in a follow-up interview stated they were not aware of it nor had they used it yet.

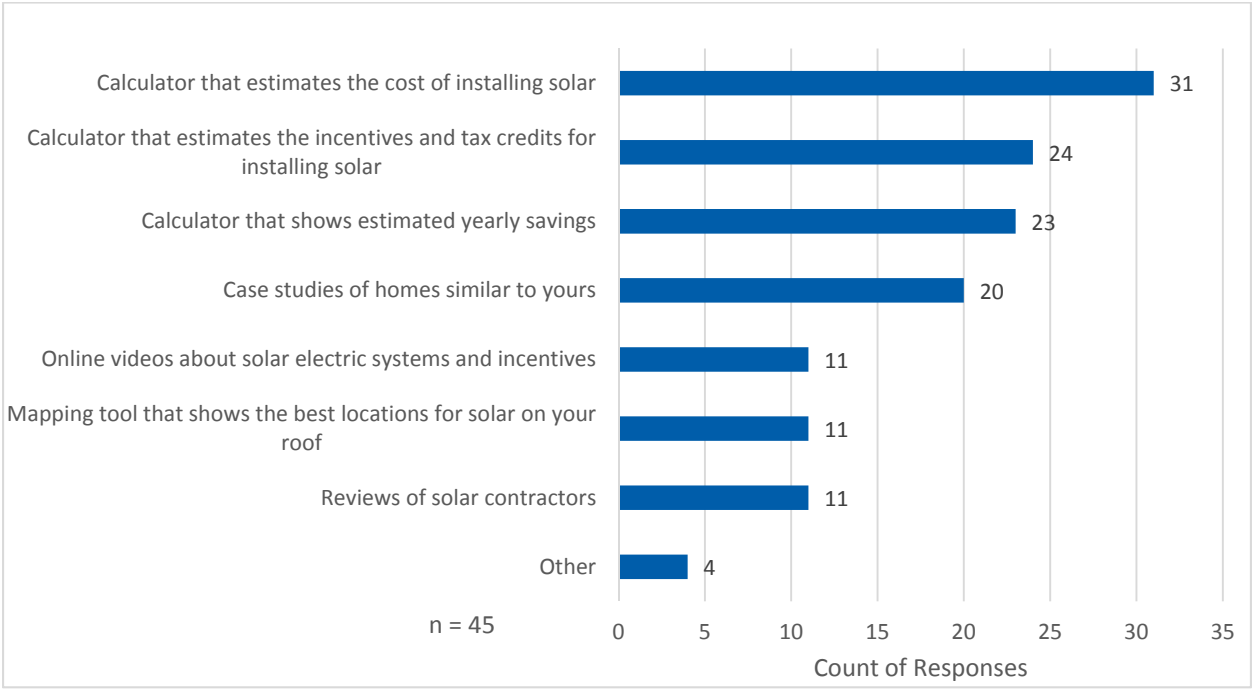
Lease and purchase interviewees stated they were generally aware of the Solar Calculator but that most often the contractor provided financial pro formas, which detailed estimated production, system cost, and incentive impacts, with the quote for installing the solar electric system.

Figure 2. Types of Information or Assistance that would be Most Valuable in Making Decisions Regarding Solar (Event Attendees)



Source: Energy Trust Solar Market Research Online Survey Question: G1. Multiple responses allowed.

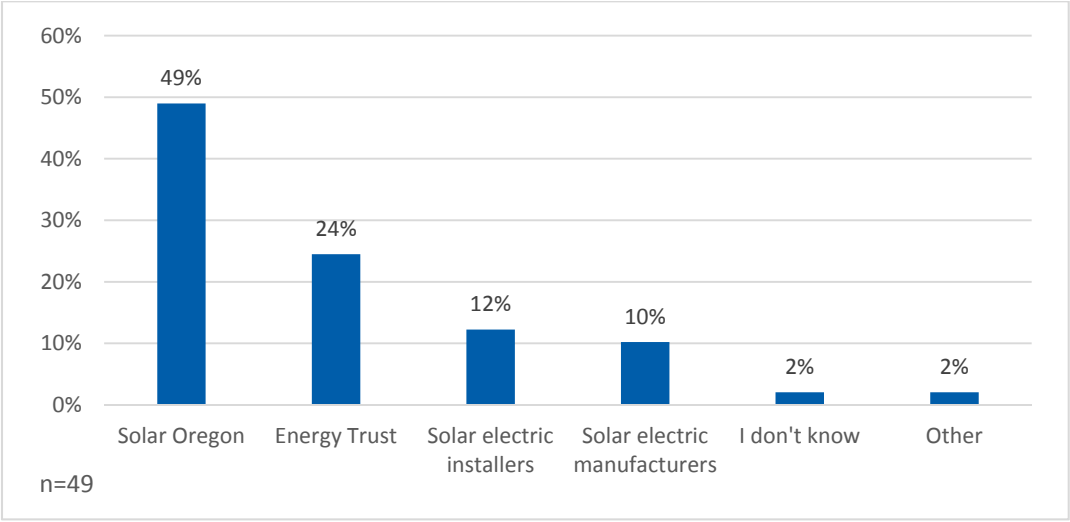
Figure 3. Tools That Would be Most Helpful in Decision Making around Solar (Event Attendees)



Source: Energy Trust Solar Market Research Online Survey Question: G4. Multiple responses allowed.

When event attendees were asked where they would most likely go to get reliable information about installing a solar electric system, 73% said that they would most likely go to Solar Oregon or Energy Trust (Figure 4).

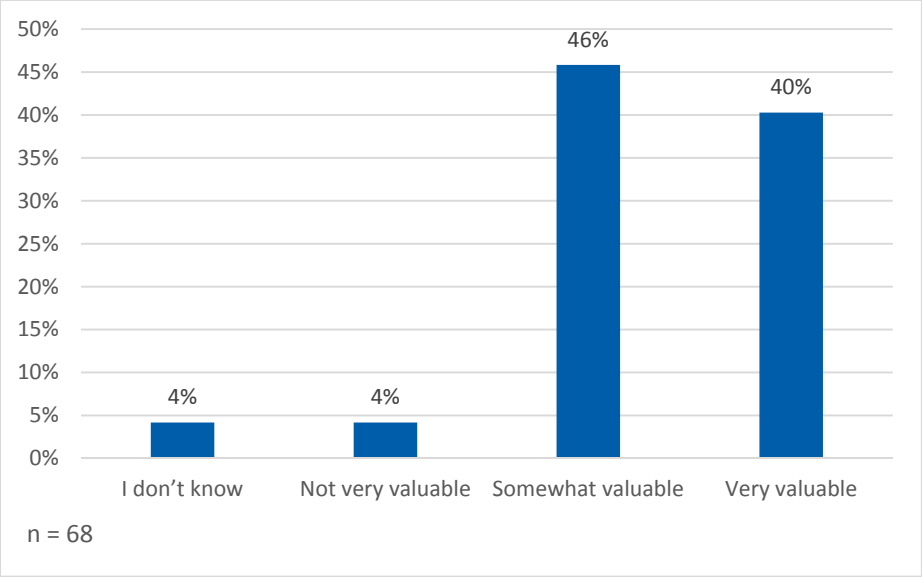
Figure 4. Channels Event Attendees Would Most Likely Go To For Reliable Information on Solar



Source: Energy Trust Solar Market Research Online Survey Question: G5

Among event attendees, the majority of respondents (86%) said that the information received from the workshop was somewhat or very valuable in deciding if solar was a good choice for their homes (Figure 5). We describe suggestions for improvements later in this section.

Figure 5. How Valuable the Information at the Solar Oregon Event Was in Making a Decision on Installing Solar



Source: Energy Trust Solar Market Research Online Survey Question: G6

Helpful Information and Resources for Program Participants

Purchase and lease customers said the most valuable types of information in making decisions regarding installing their solar electric systems were Energy Trust's Solar Calculator tool, information on the Energy Trust website, a walkthrough survey of the whole home by an Energy Trust advisor, and Energy Trust's list of solar trade allies (Figure 6).

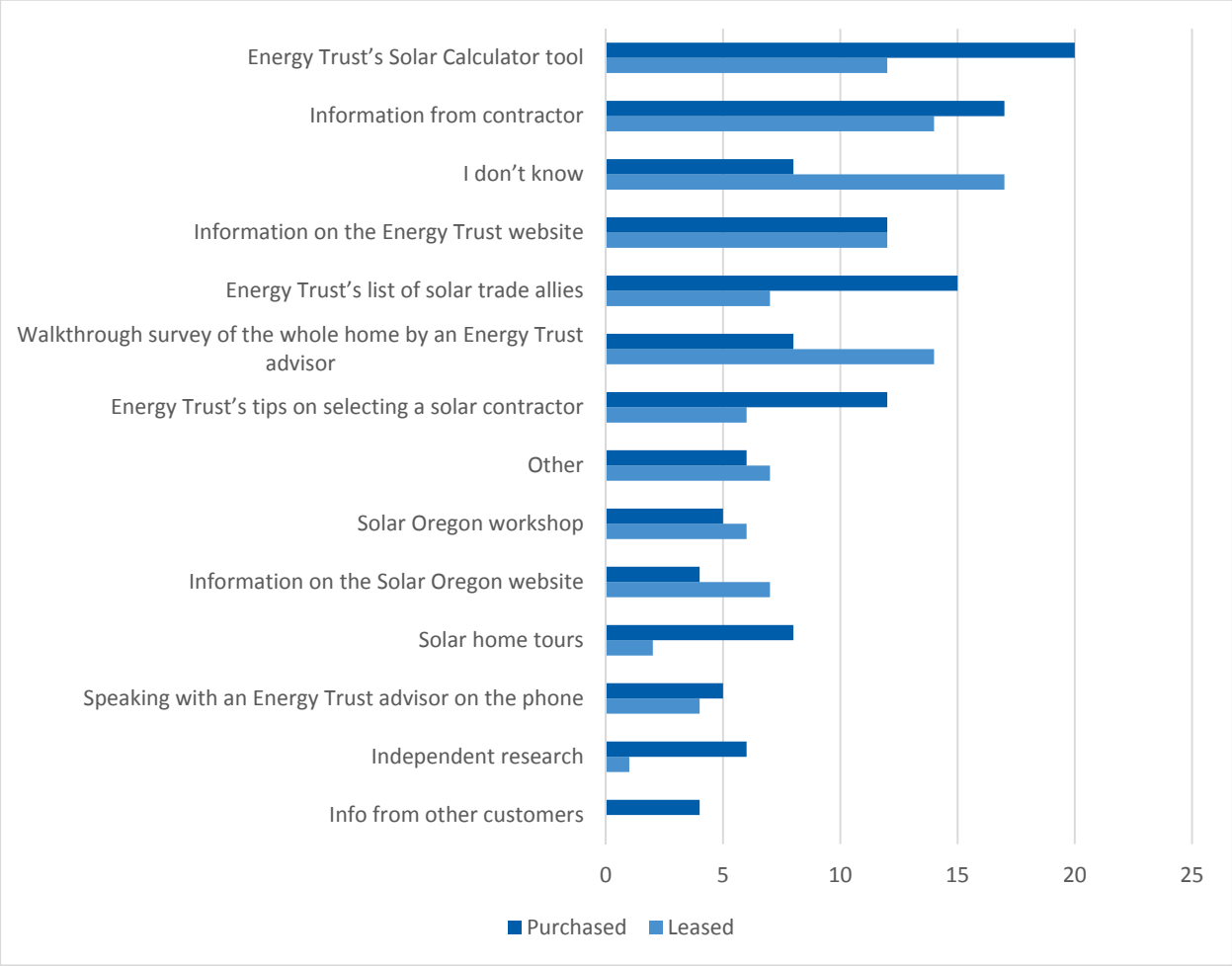
Purchase and lease customers said the most valuable information they received during the decision-making process was the financial package showing the cost of the system, the impact of incentives, and expected production. This information gave them an expected payback period for the installation. Many purchase interviewees said they received this information directly from their contractor.

Event attendees said explanations of financing and expected savings were the most important pieces of information to influence their decision to install a solar electric system.

Among follow-up interviewees, the most commonly preferred channel to receive information was via e-mail because it allows them to filter the information and pursue subjects that are of most interest. Radio ads were also popular. Solar Oregon regularly sends e-mail blasts to list-servs and Energy Trust currently runs radio ads about the program; this approach appears to align well with customer preferences. In addition to e-mail and radio, some interviewees stated they learned about other Energy Trust programs through television ads, but had not seen any related to the solar electric program. Their opinion was

that television ads related to solar would be another effective channel to spread awareness and important information.

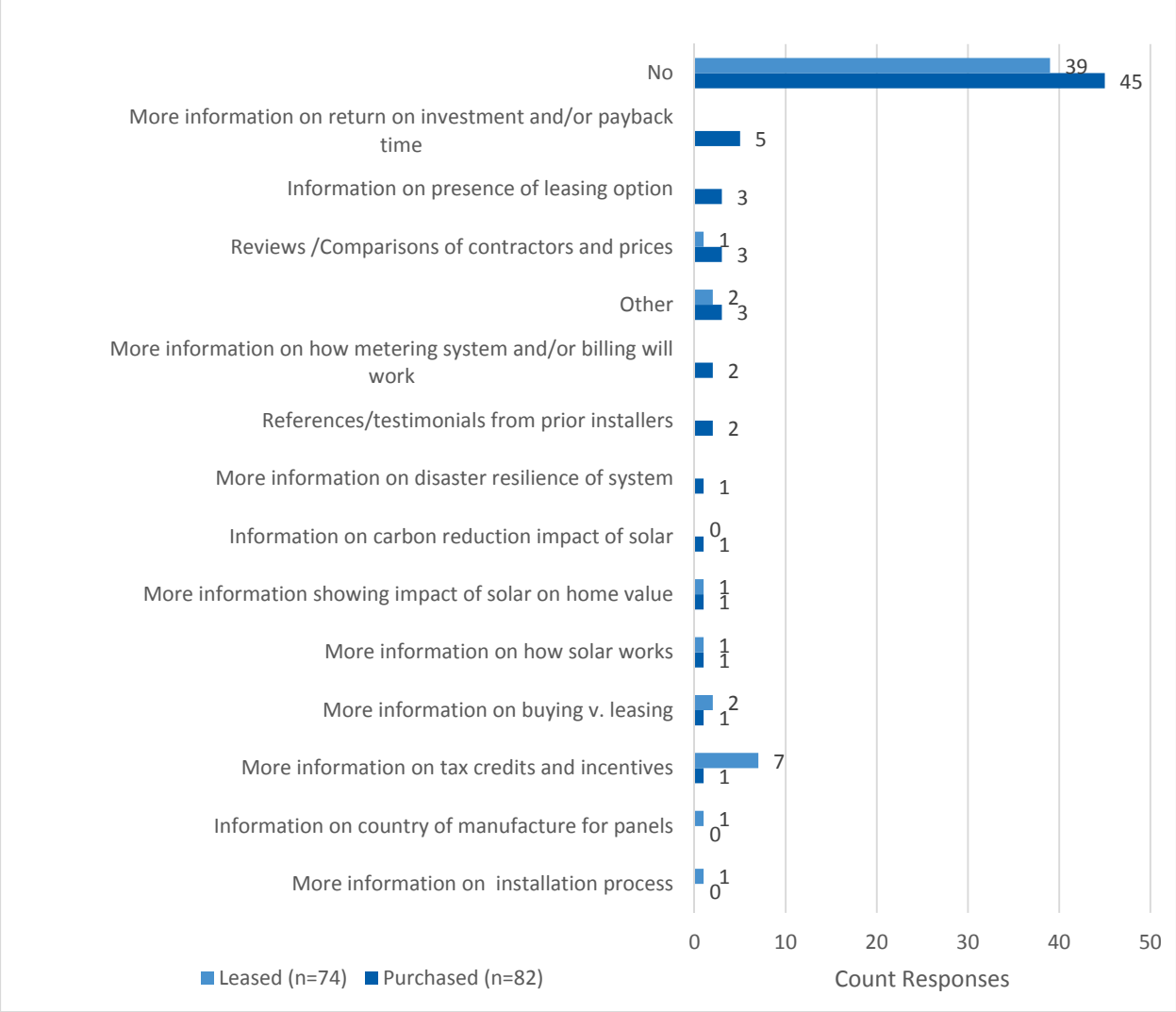
Figure 6. Valuable Information in Making Decisions Regarding Installing Solar



Source: Energy Trust Solar Market Research Online Survey Question: G2

When asked what information would have made the decision easier, the majority of purchase and lease respondents said there were none. However, a few said they wanted more information on tax credits and incentives and on return on investment and/or payback time (Figure 7).

Figure 7. Information That Would Have Made Decision Making Easier for Program Participants



Source: Energy Trust Solar Market Research Online Survey Question: G3. Multiple responses allowed.

Suggestions for Improvements

Survey respondents made the following suggestions for making future Solar Oregon workshops more useful for attendees:

- Provide information on cost savings, return on investment, and financing during the workshops
- Provide information on the experience of prior customers (testimonials/guest speakers) and example projects
- Hold workshops more frequently and publicize them more
- Provide information on incentives and the steps to receive them

In our review of workshop materials, information related to cost savings, return on investment, and financing was discussed. We find survey respondents' suggestions underscore the importance of that

information to program participants' decision making process and should continue to be included in workshop materials.

Survey respondents made the following suggestions regarding the residential solar electric incentive offer:

- Continue to provide the incentives
- Advertise the incentives more frequently
- Explain how incentives work with tax credits
- Raise system-size caps
- Provide a step-by-step guide to accessing incentives

Customer Motivations and Barriers

Energy Trust and Solar Oregon staff said they believed customers participated in the program to lower energy bills, reduce environmental impacts or carbon footprint, increase energy price security, be energy independent, experience a "cool" tech factor, and possibly to respond to "competitive" influences among neighbors. These reasons are consistent with results from program participants' and event attendees' online survey and follow-up interviews.

Program participants who completed an installation said lower electricity bills were the most common motivator.

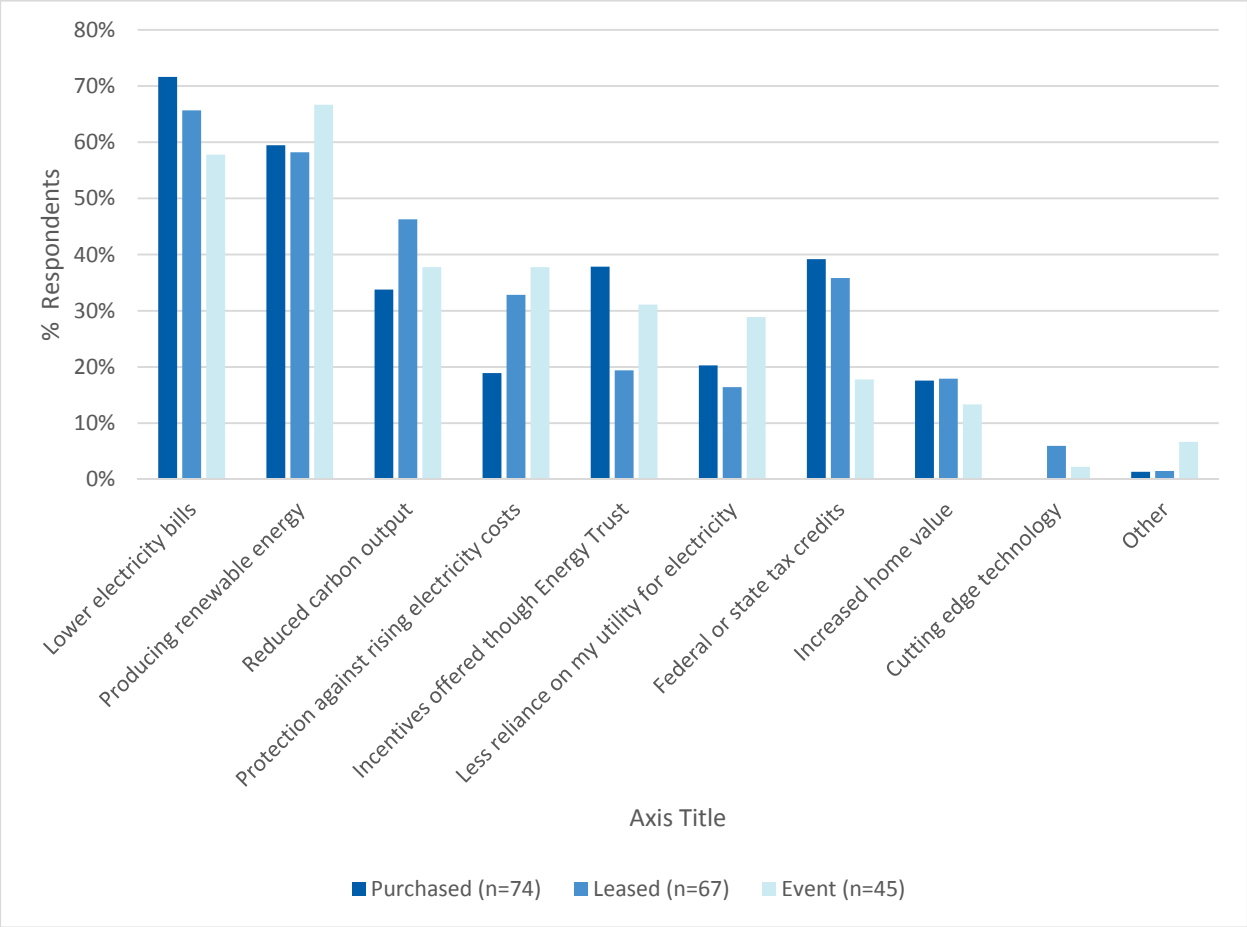
Energy Trust and Solar Oregon staff said they believed customers' barriers to participation were high initial costs, paying for installation of the system before tax credits were provided, competition with other home improvement projects, not knowing where to start, time commitment, and/or not fully understanding the technology. All of these could contribute to customers' hesitation to reach out to trade allies for more information.

Energy Trust and Solar Oregon staffs' perceived barriers to participation were somewhat aligned with the feedback we received from the survey and follow-up interviews. Survey respondents said their most common challenges were high upfront cost, tree removal, or site alterations.

Reasons for Wanting Solar and Perceived Benefits

Among all survey respondents (purchase customers, lease customers, and event attendees), the most widely cited reasons for wanting a solar electric system were lowering electricity bills and producing renewable energy (Figure 8).

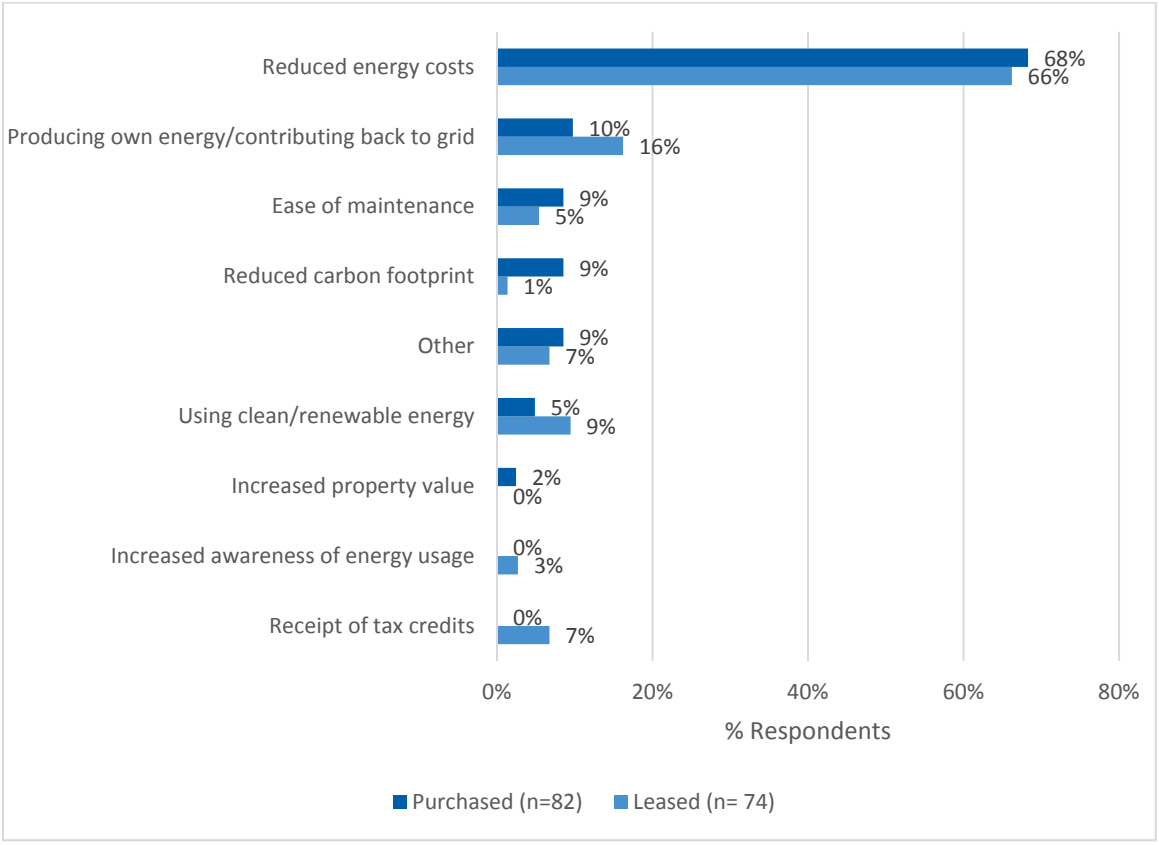
Figure 8. Reasons for Wanting a Solar Electric System



Source: Energy Trust Solar Market Research Online Survey Question: D1. Multiple responses allowed.

The majority of purchase and lease participant survey respondents said the greatest benefit of the solar electric system was reduced energy costs. They also cited the ability to produce one's own energy and contribute back to the grid, and the ease of maintaining the systems (Figure 9).

Figure 9. Greatest Benefits since Installing a Solar Electric System

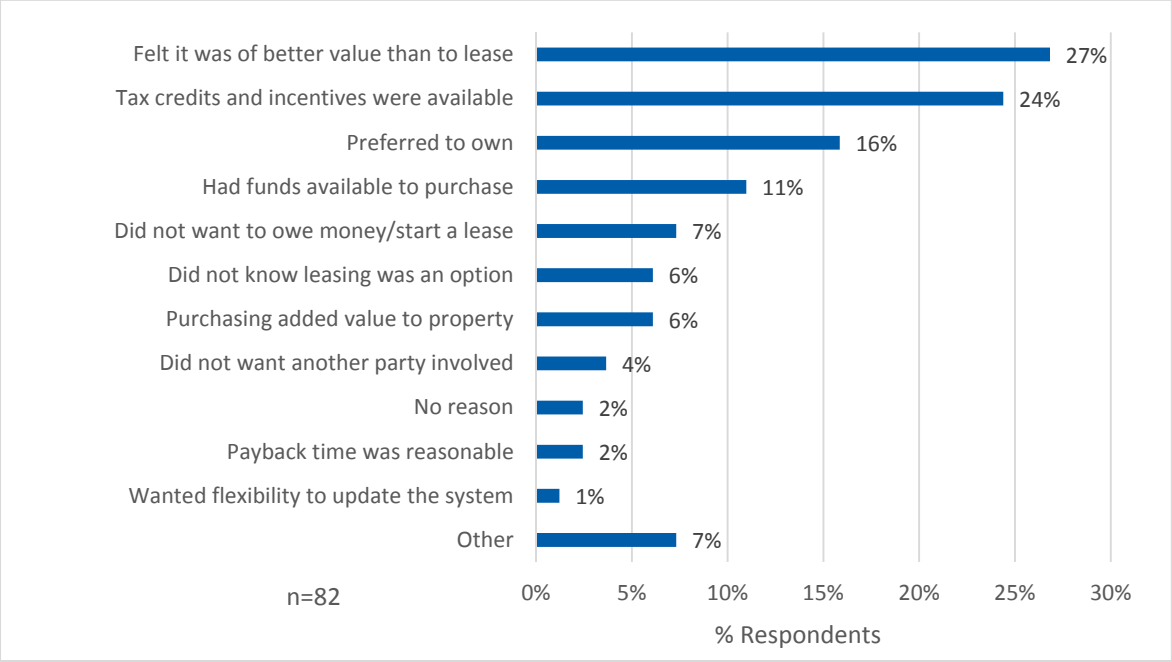


Source: Energy Trust Solar Market Research Online Survey Question: D2. Multiple responses allowed.

Reasons for Purchasing or Leasing Systems

The majority of purchase participants said they decided to buy rather than lease their solar electric system because they believed it was a better value, tax credits and/or incentives were available, or they preferred to own their system (Figure 10).

Figure 10. Reasons for Purchasing Instead of Leasing a Solar Electric System



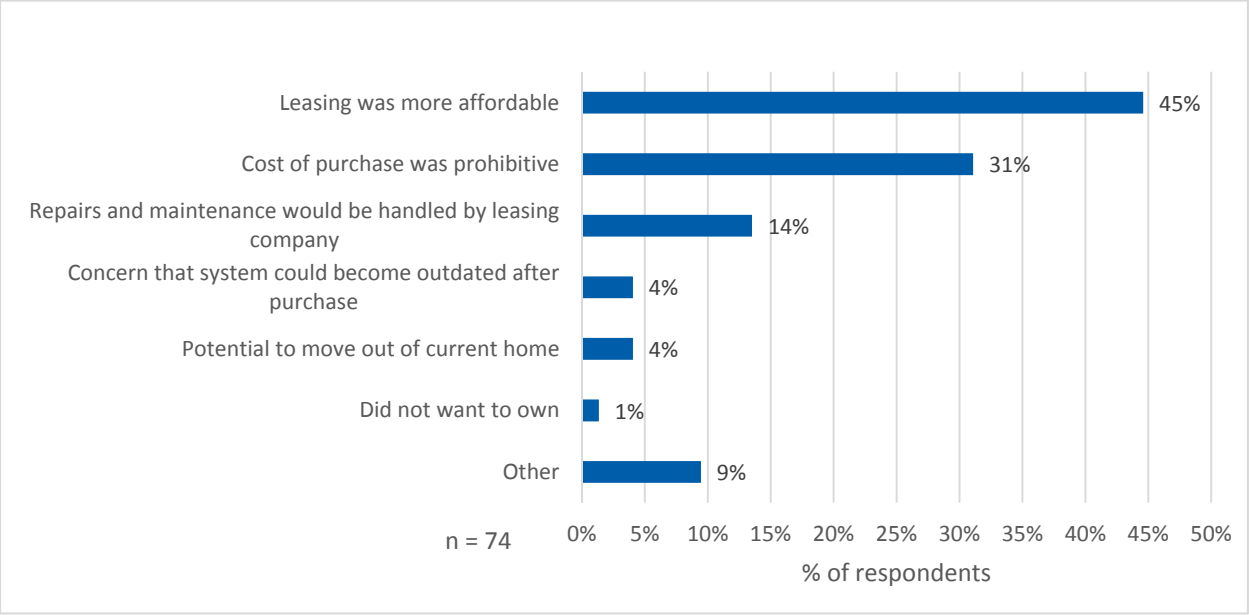
Source: Energy Trust Solar Market Research Online Survey Question: D3. Multiple responses allowed.

The majority of lease participants said they chose to lease because it was more affordable and/or because the cost of purchasing the system was prohibitive. Several respondents also said it was convenient to have repairs and maintenance managed by the lessor.

The majority of lease participants said they would have seriously considered purchasing the solar electric system if they had access to a loan that eliminated the upfront cost and had payments that were lower than the utility bill savings over time (Figure 11). Several lease participants in the follow-up interviews said that the term length of the lease would be an important factor. They also wanted the interest payment of the loan to be competitive with other loans available in the market, such as a home equity line of credit.

We note that several interviewees who said they were interested in a loan product in the survey changed their responses during the interview. These interviewees gave reasons such as a lack of interest in ownership, concerns about maintaining the system, and concerns about the system becoming obsolete.

Figure 11. Reasons for Leasing Instead of Purchasing a Solar Electric System

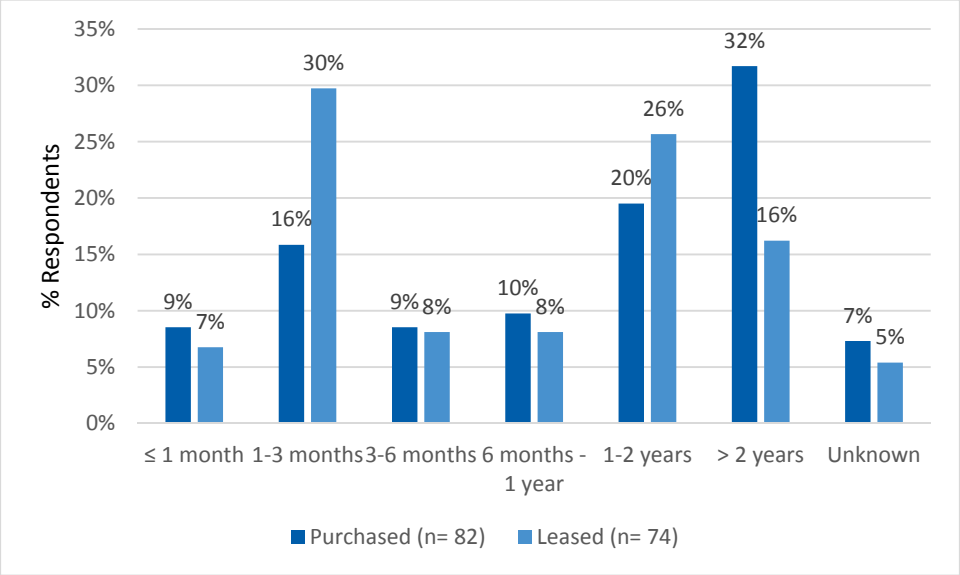


Source: Energy Trust Solar Market Research Online Survey Question: D4. Multiple responses allowed.

When asked how long they considered installing a solar electric system before moving forward, 52% of purchase customers and 42% of lease customers said over one year. Significantly more purchase customers than lease customers chose installation after considering for more than two years. More lease customers (30%) chose to move forward one to three months after considering a system than purchase customers (16%) (Figure 12).

In follow-up interviews, purchase customers said receiving a realistic cost estimate helped give them the confidence to take the next steps. They also said they thought it necessary to do background research before contacting a solar trade ally for a site visit and cost estimate, which delayed getting the critical information they were looking for.

Figure 12. Length of Time a Participant Considered Installing a Solar Electric System before Making the Decision



Source: Energy Trust Solar Market Research Online Survey Question: D6

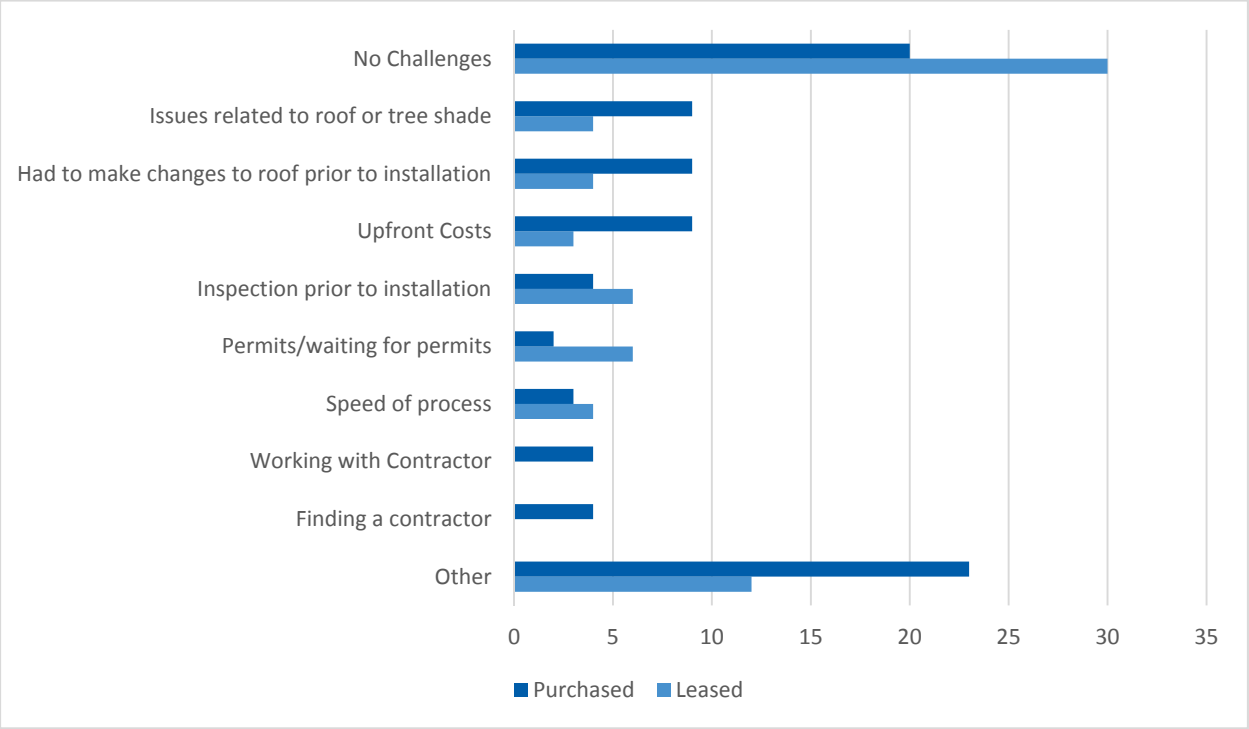
Challenges and Barriers to Installing Solar

Both purchase and lease customers said there were few challenges to installing a solar electric system. Among purchase customers, the three most common challenges concerned tree shading, site alterations, and upfront costs. Among lease customers, the three most common challenges were obtaining permits and waiting for permits, inspection prior to installation, and speed of the entire process (Figure 13).

Both lease and purchase interviewees often emphasized the ease of installation and their contractors' turnkey service, which eliminated any problems with permitting and applying for incentives.

Two purchase interviewees said filing for the Oregon state tax credit was particularly difficult because their tax form offered no clear place to include that tax deduction. Because they were unsure where to get clarification, they had to hire a tax professional to file their taxes when they would not otherwise have required that service. The added cost of the tax professional rendered the tax credit of less worth to them.

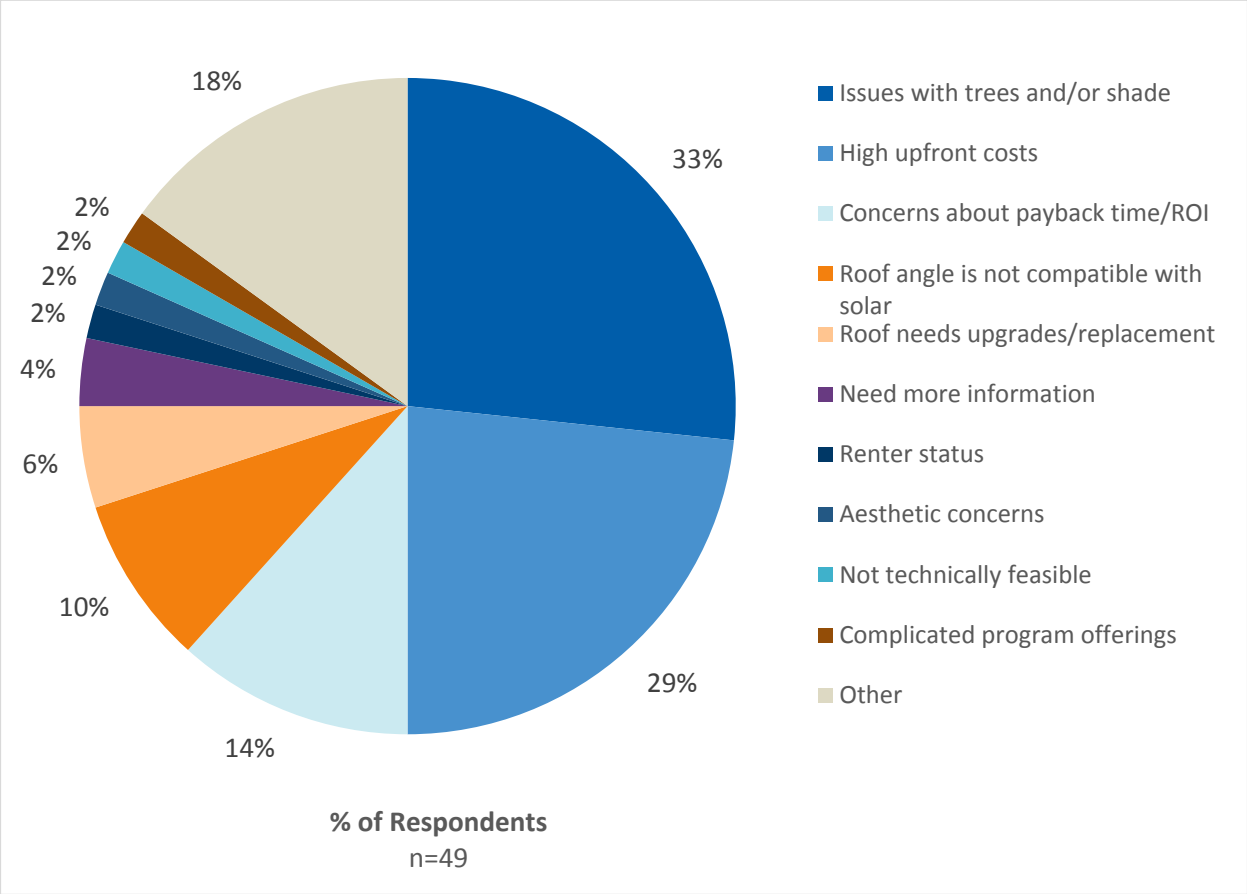
Figure 13. Challenging Aspects to Installing Solar



Source: Energy Trust Solar Market Research Online Survey Question: E1. Multiple responses allowed.

Event attendees said barriers to installing solar were issues with trees and/or shade, high upfront costs, and concerns about payback time and return on investment (Figure 14).

Figure 14. Major Barriers to Installing Solar (Event Attendees Only)



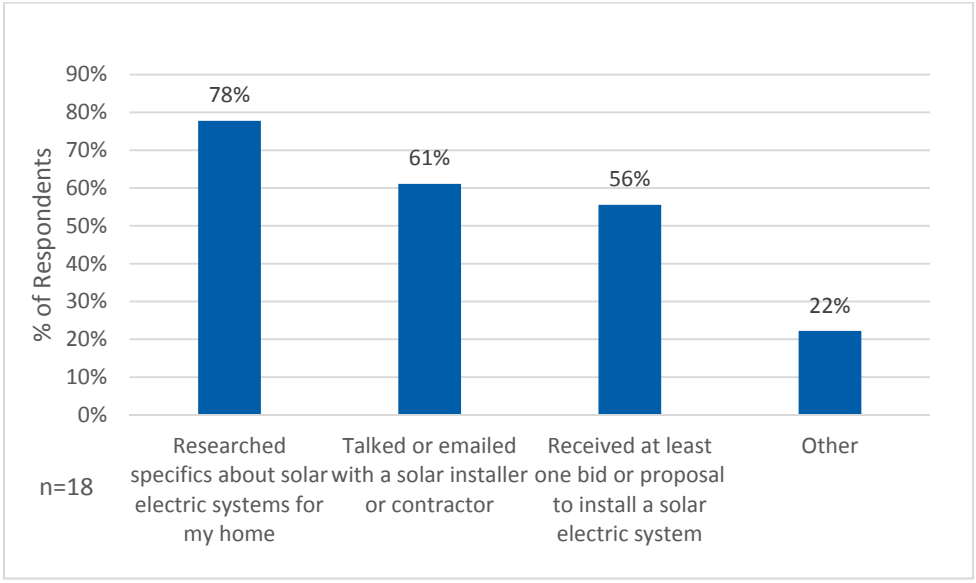
Source: Energy Trust Solar Market Research Online Survey Question: E2. Multiple responses allowed.

Event Attendees Actions after Attendance

Of the event attendees surveyed (n=50), about two-thirds (32 or 64%) said they did not initiate any steps toward installing a solar electric system in their home after the workshop or event, while 18 respondents (36%) initiated steps. Their reasons are discussed in more detail below.

The most common ways event attendees said they took steps to installation were by researching specifics about solar electric systems for their home (14 respondents, 78%), talking with or e-mailing a solar installer or contractor (11 respondents, 61%), or receiving at least one bid or proposal to install a system (10 respondents, 56%); however, only one respondent out of 18 began installations. (Figure 15).

Figure 15. Steps Taken by Event Attendees toward Installing a Solar Electric System

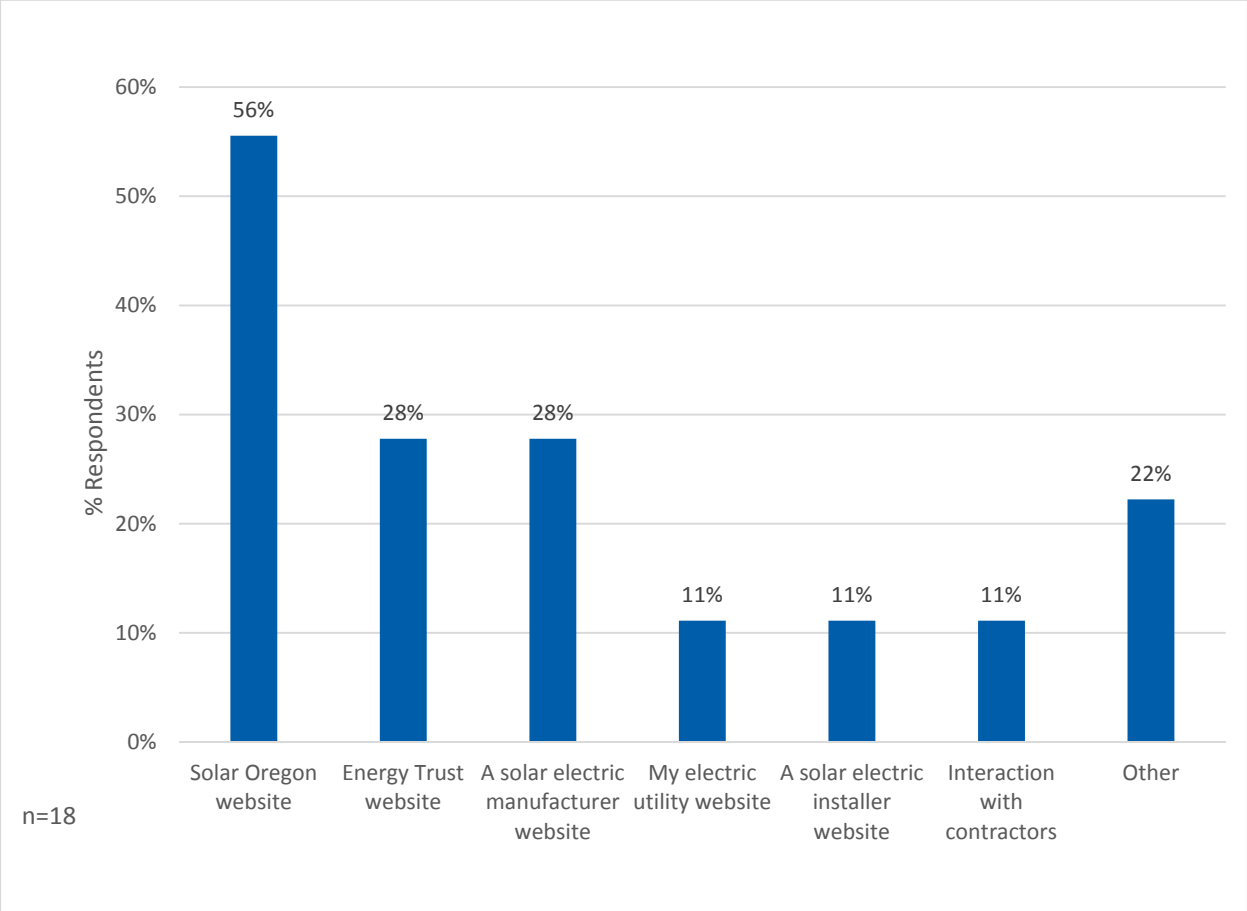


Source: Energy Trust Solar Market Research Online Survey Question: C4. Multiple responses allowed.

To research specifics about solar electric systems, event attendees visited the Solar Oregon website (10 respondents, 56%), the Energy Trust website (5 respondents, 28%), or a solar manufacturer website (5 respondents, 28%).

Interviewees from all groups said they had visited the Energy Trust website and had found the information they were looking for. Most often, interviewees were looking for additional information on available incentives or solar trade allies.

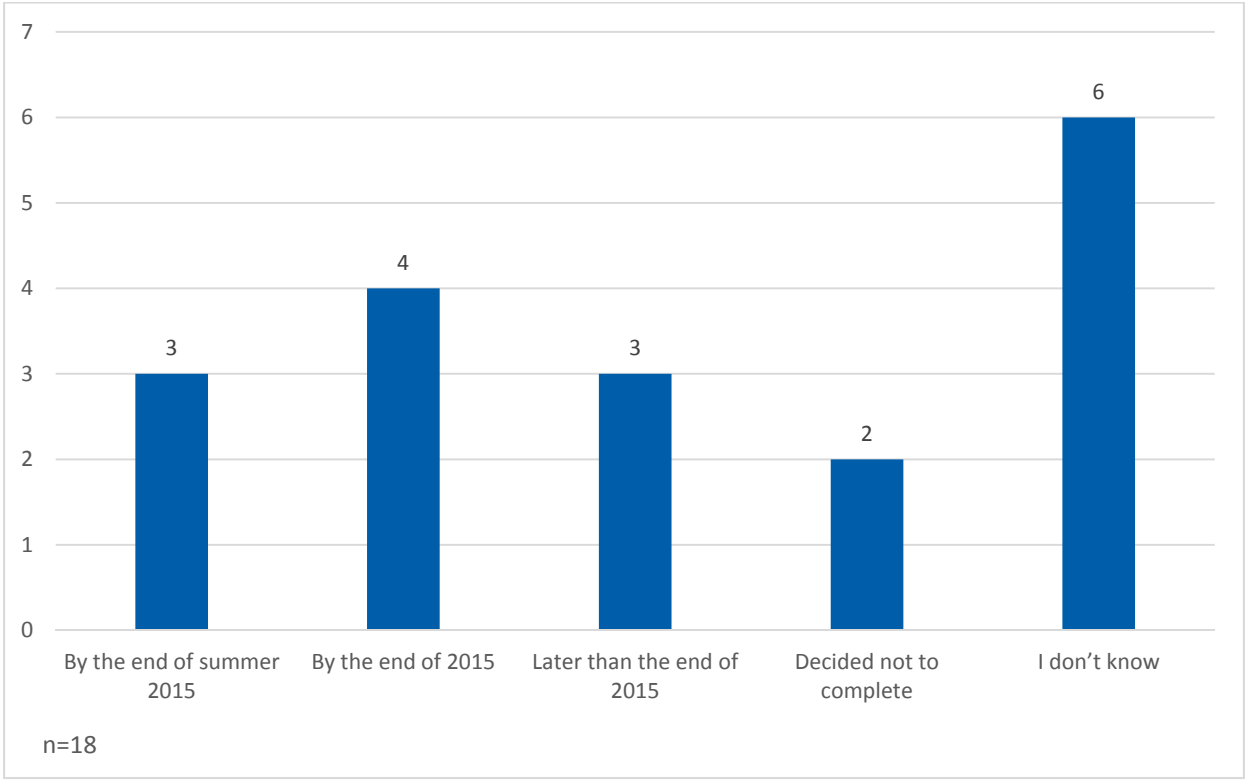
Figure 16. Resources That Event Participants Consulted to Research Solar Electric Systems



Source: Energy Trust Solar Market Research Online Survey Question: C5. Multiple responses allowed.

Out of the 18 event attendees who said they had taken steps to installing a solar electric system, 6, or one-third, said they did not know when they expected to complete their installation. Seven respondents (39%) expected to complete the system this year (Figure 17).

Figure 17. When Event Attendees Expect to Complete Solar System Installation

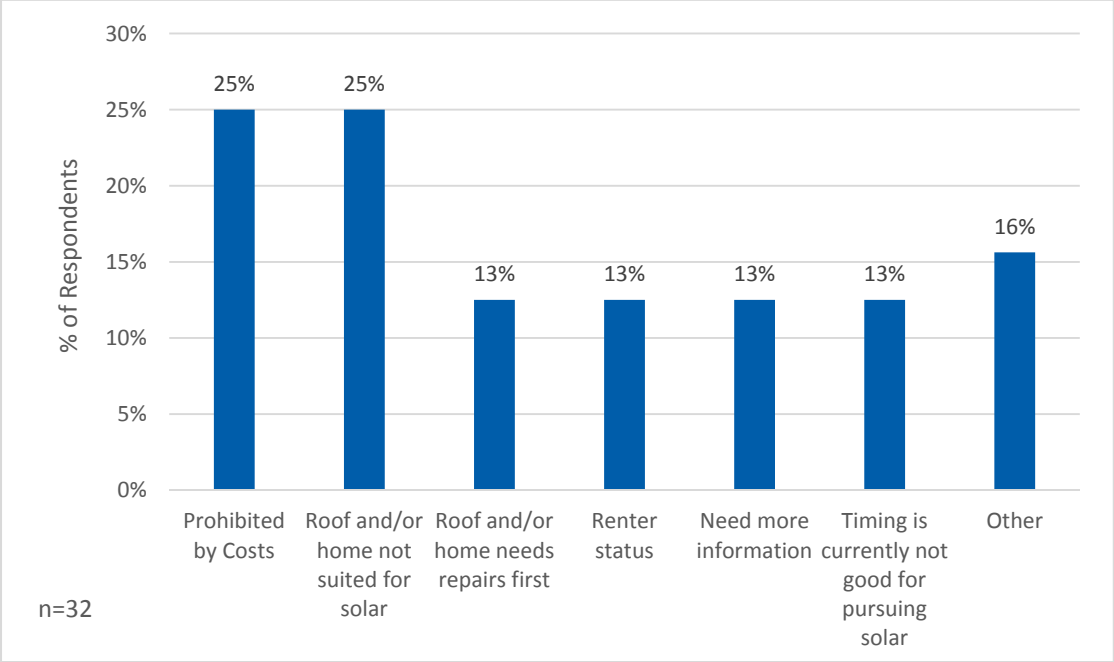


Source: Energy Trust Solar Market Research Online Survey Question: C6

Two event attendees said they had decided not to complete their solar installation. Both said the reason was related to cost. One customer also said it would not lead to very much savings in her home. The other customer said the contractor she worked with explained she would not qualify for rebates for the installation.

Event attendees who did not initiate any steps toward installing a solar electric system after the workshop (32 out of 50) said the most common reasons for their decision were the prohibitive costs (25%) and because their home and/or roof was not well suited for a solar electric system (25%) (Figure 18).

Figure 18. Reasons for Not Pursuing a Solar Electric System (Among Event Attendees)



Source: Energy Trust Solar Market Research Online Survey Question: C7. Multiple responses allowed.

Customers' Advice for Others Considering Solar

We asked if survey respondents had advice for others considering solar. Lease customers' three most common pieces of advice were:

- Install the system now (before incentives disappear, because it is a good investment, because it is good for the environment, etc.).
- Do research before installing (on costs, return on investment, technology, different contractors, best place to install, terms of the contract, all benefits involved, etc.).
- Install a solar electric system because it will benefit the environment.

Purchase customers' three most common pieces of advice were:

- Install the system now (before incentives disappear, because it is a good investment, because it is good for the environment, etc.).
- Do research before installing (on costs, return on investment, technology, different contractors, best place to install, terms of the contract, all benefits involved, etc.).
- It will reduce one's electricity bill.

Event attendees who did not participate in the program most often gave these three pieces of advice:

- Do research before installing (on costs, return on investment, technology, different contractors, best place to install, terms of the contract, all benefits involved, etc.).

- Install the system now (before incentives disappear, because it is a good investment, because it is good for the environment, etc.).
- Installing solar is cost-effective and/or affordable; installing will lead to a quick return on investment.

Demographics

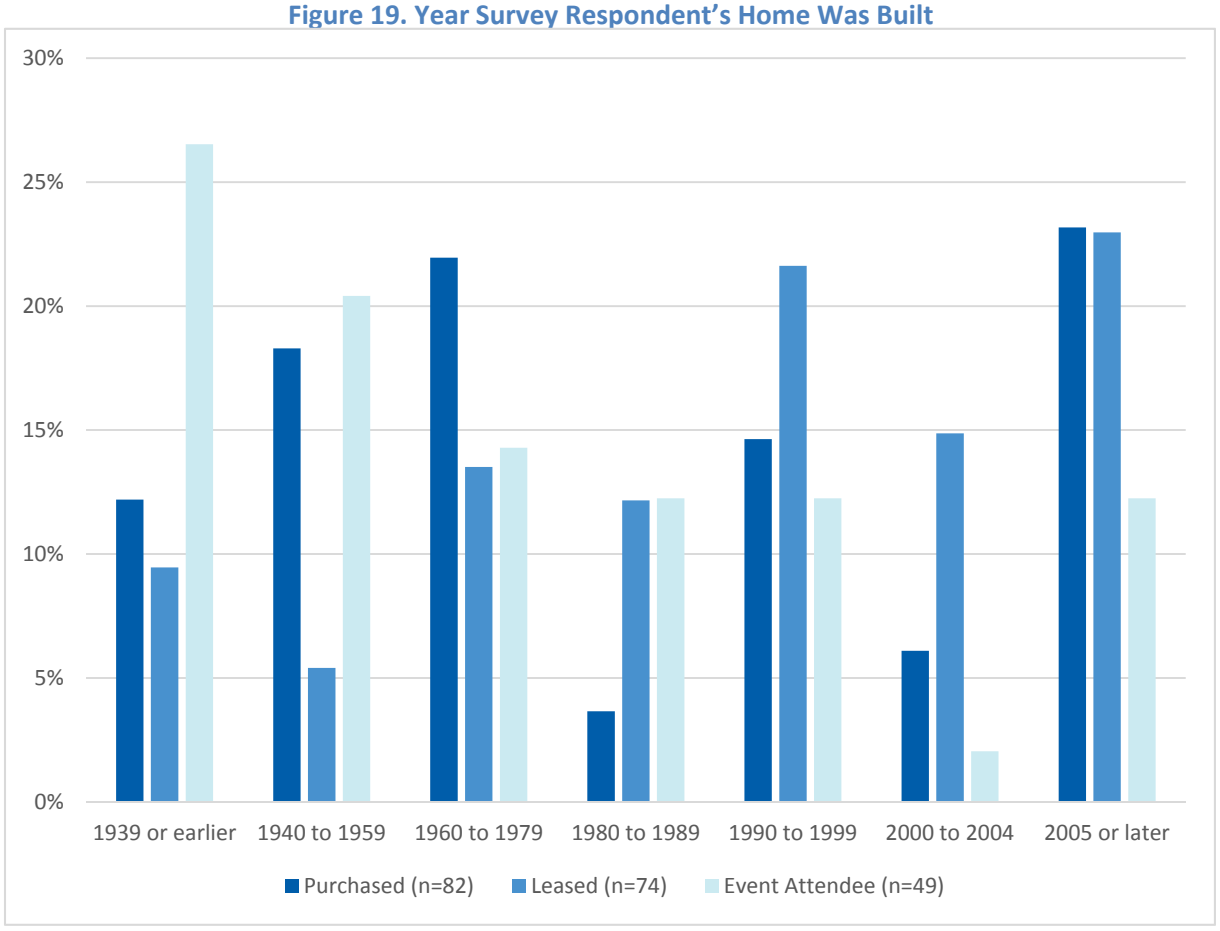
Target Audiences and Customer Base

Energy Trust's solar electric program serves customers of Pacific Power and Portland General Electric. The program's target residential audience is single-family homeowners who are served by these utilities, are *not* located in a historically designated community and have at least 300 square feet of roof that faces east, south or west. According to Energy Trust and Solar Oregon staff, this audience generally has an annual income of at least $50,000 to $75,000. They are college educated, moderately tech savvy and have access to discretionary savings and/or good credit.

Prior to this study, Energy Trust's most recent market research was conducted in 2007. That research produced information on customer barriers and perceived benefits and the results of message testing. Energy Trust learned that people perceived that solar electric systems were complicated and confusing, and it responded by making efforts to communicate the simplicity of solar electric systems. According to a Solar Oregon staff member, customers have dramatically increased their awareness and understanding of solar electric systems over the last five years. Today many customers are familiar with how solar works and conversations have shifted from general explanations of the technology to discussions of the specifics of installing a solar electric system on a customer's home.

The majority of survey respondents (94%) lived in detached single-family homes. Homes ranged in age, as shown in Figure 19. As the chart depicts, Lease participants tend to live in newer homes with homes built in 2005 or after being the most common response, whereas event attendees tended to live in older homes with homes built in 1939 or earlier being the most common response for the group.

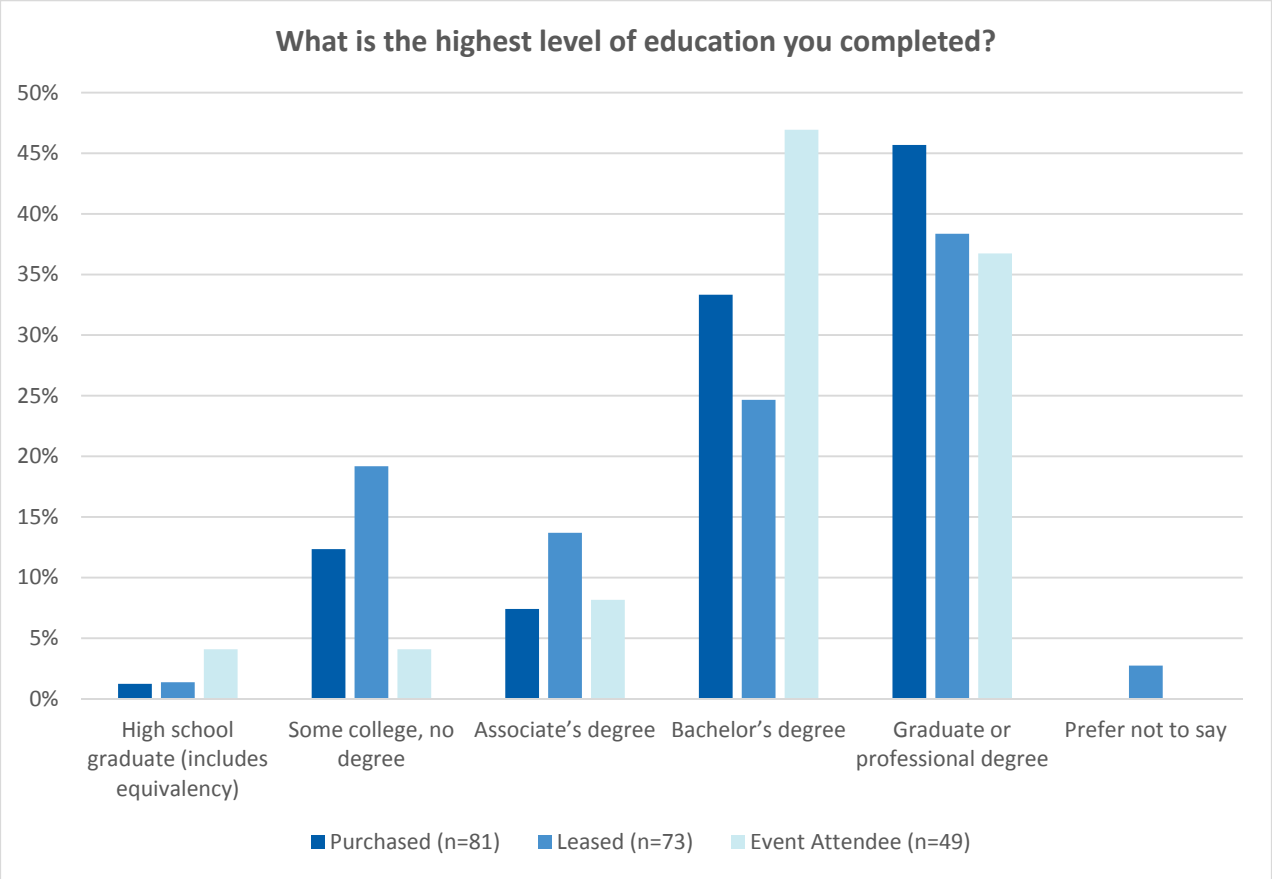
Figure 19. Year Survey Respondent's Home Was Built



Source: Energy Trust Solar Market Research Online Survey Question: H3

The majority of respondents had a bachelor's, graduate or professional degree. The respondents who purchased their solar electric systems included the largest percentage of customers with graduate or professional degrees (Figure 20).

Figure 20. Highest Level of Education Completed by Survey Respondent

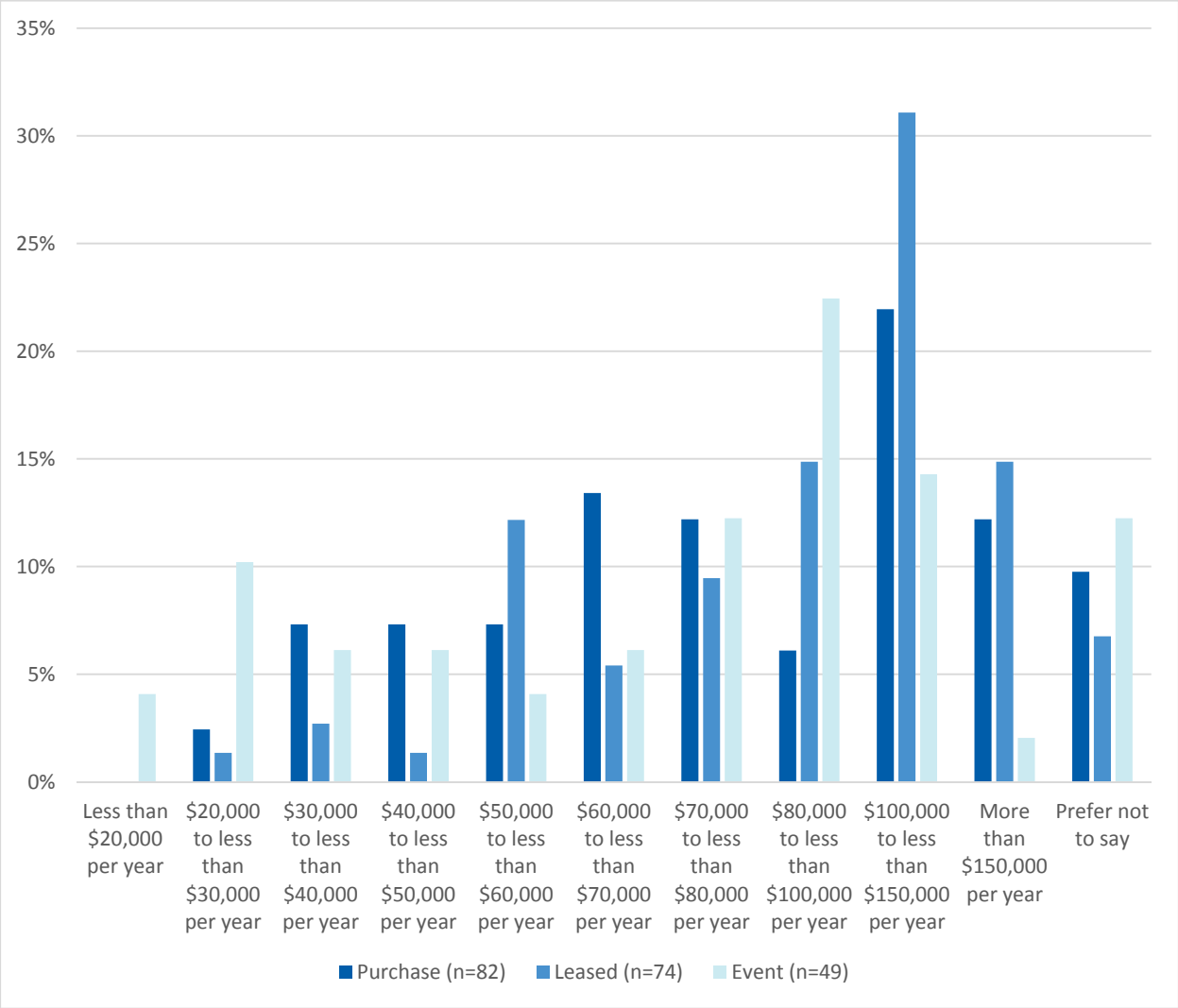


Source: Energy Trust Solar Market Research Online Survey Question: H4

Among all respondents, 17% (35 respondents) had incomes of $50,000 - $70,000, the income range identified by Energy Trust and Solar Oregon staff as the target audience for the solar electric program. 24% had incomes of $70,000 - $100,000, and 34% had incomes of $100,000 or above. Of lease and purchase customers, 61% had incomes of $70,000 or above, and 30% had incomes of $100,000 or above.

There was a greater percentage of purchase or lease respondents who were within the income bracket of $100,000 or above compared to event attendee respondents (Figure 21).

Figure 21. Annual Household Income of Survey Respondent



Source: Energy Trust Solar Market Research Online Survey Question: H5

Conclusions and Recommendations

Awareness

Conclusion: The most common way customers first learned about Energy Trust's solar incentive was through a contractor. This indicates that Energy Trust's solar trade allies are many times the first point of contact for interested customers. This underscores the importance of ensuring solar trade allies are well-informed about available financing, incentive offerings and Energy Trust resources, and share them with customers.

- **Recommendation:** Conduct regular follow-ups with contractors (via webinar, e-mail, or in-person group meetings) to ensure they are aware of Energy Trust resources to share with customers (e.g., Solar Calculator tool, workshops) and so Energy Trust can receive feedback on any challenges or barriers in how it promotes the program to customers.
- **Recommendation:** Consider holding a contractor focus group to better understand any challenges or barriers in promoting the program to customers and to identify potential opportunities and interest in collaborative marketing with Energy Trust.

Conclusion: The Energy Trust website and an Internet search were the second and third most frequently cited sources through which purchase customers learned about the Energy Trust programs and were the second and sixth most frequently cited for lease customers. This underscores the importance of ensuring that the information customers seek is readily available through online channels. Such information is necessary to help customers to move from initial interest to participation.

- **Recommendation:** Identify the information that customers most need to make decisions on solar and ensure this information and associated resources are readily available and easily accessible on the Energy Trust website. Based on the data collected, customers are most interested in realistic cost estimates and savings potential.
- **Recommendation:** Use Google Analytics and other search engine traffic information to identify the most popular keywords that bring customers to the Energy Trust site. Consider conducting search engine marketing through paid search advertisements to drive customers to the Energy Trust site.

Conclusion: Customers also cited learning about the Energy Trust solar incentive through a family member, friend, co-worker, or neighbor, suggesting this could be a promising channel through which to promote the program.

- **Recommendation:** Consider a "refer a friend" promotion to encourage program participants to share information about the Energy Trust solar incentive with others. This could be executed digitally or through collateral such as postcards. Customers would receive an e-mail after participating in the program with a "forward to a friend" link, or customers could receive several postcards in the mail after participation, which they could mail to a friend.

Marketing Preferences

Conclusion: Program participants and event attendees said information on return on investment/payback time would be helpful (or was helpful) in making decisions around solar. Although Energy Trust provides information on the availability of financing and incentives on its website and program collateral, there is not enough information and messaging about energy and dollar savings from a solar electric system.

- **Recommendation:** Consider incorporating more information about the energy and cost savings of a solar electric system and the estimated payback time on the Energy Trust and Solar Oregon websites and collateral. The information should emphasize why installing solar makes sense from a financial standpoint. Where some information must be site specific, provide averages within the state to give an approximation, such as average installed costs ($/W) and average kWh production per kW.

Conclusion: Follow-up interviewees most commonly preferred to receive information via e-mail because they can filter the information and pursue subjects that are of most interest. Radio ads were also popular. Solar Oregon regularly sends e-mail blasts to list-servs and Energy Trust currently runs radio ads about the program; this approach appears to align well with customer preferences.

Conclusion: Several follow-up interviewees said they preferred to learn about the program through TV ads; they had seen TV ads for other Energy Trust programs and found them effective but had not seen any for the solar program.

- **Recommendation:** Consider running TV ads about solar program incentives for homeowners to lower the costs of installing a solar electric system and give resources so interested homeowners can learn more.

Conclusion: Program participants and event attendees said testimonials from prior customers and example projects would be helpful (or were helpful) in making decisions around solar. Although there are example projects available on the Solar Oregon website, there is no obvious link to this resource on the Energy Trust website, and the case studies also do not consistently provide information on cost savings and estimated payback time.

- **Recommendation:** Consider creating a more obvious link to Energy Trust success stories on the Energy Trust website, such as the ones referenced on the Solar Oregon webpage.
- **Recommendation:** Consider updating and streamlining the example projects featured on the Solar Oregon site to include information on cost savings and estimated payback time.
- **Recommendation:** Consider incorporating more testimonials and example projects in the workshop presentation. Whenever possible, consider asking a prior program participant to attend the workshops to share his or her experience and answer questions.

Conclusion: Event attendees said information about the pros and cons of purchasing versus leasing a system would be helpful in making decisions about installing a solar electric system. Although this

information is provided in the Solar Oregon workshop presentation, it is not prominently featured on the Energy Trust Solar and Solar Oregon websites.

- **Recommendation:** Consider incorporating information on the pros and cons of purchasing or leasing a system (and include information about loans) on the websites to provide customers easy access to this information and assist them in making their decision.

Conclusion: Event attendees said a calculator that estimates the cost, incentives and tax credits for installing solar, and shows estimated yearly savings would be helpful in making a decision on solar. All of these are already available through the Solar Calculator tool on the Energy Trust website.

- **Recommendation:** Ensure that the availability and functions of the Solar Calculator tool are communicated in all workshop presentations. Consider demonstrating this tool during the workshop session and explaining how to calculate estimated costs, incentives and tax credits, and yearly savings.
- **Recommendation:** Consider creating a vanity URL for the Solar Calculator tool and revising program collateral to promote this online resource directly to customers.

Conclusion: Solar Oregon does not regularly collect feedback from event attendees, which may be a missed opportunity to receive recommendations for improvements, as well as to provide attendees with a follow-up resources and assistance to install solar.

- **Recommendation:** After each workshop, provide attendees with a follow-up survey (in person or via email) that asks about their satisfaction with the workshop, areas for improvement for the workshop, likelihood to install a solar electric system after the workshop, and barriers to taking next steps. Once responses are collected, analyze the data on a regular basis (monthly, or quarterly) and incorporate common recommended improvements, where feasible.
- **Recommendation:** If the cited barriers to participation are easily surmountable (e.g., need for information on a pros and cons of leasing, need list of participating contractors), Solar Oregon can help address them by following up with the event attendee and providing appropriate information and resources. This would ideally help expedite the decision making process for participation among customers.

Customer Motivations & Barriers

Conclusion: Lower electricity bills and the ability to produce renewable energy were the top reasons program participants cited for wanting to install a solar electric system. Although program collateral discussed renewable energy production, there is little messaging on the anticipated savings and payback period.

- **Recommendation**: Ensure that electricity bill savings is emphasized on every piece of program material. Add information on anticipated cost savings and simple payback periods to program collateral and outreach content. This information may be site-specific, so prepare general metrics such as annual kWh production per kW installed.

Conclusion: Event attendees said the biggest barriers to installing solar were the high upfront costs and concerns about payback time/return on investment. This underscores the need to clearly address these concerns during the workshop. It is possible that those who said they received disadvantageous payback periods did not have a well-suited site for solar.

- **Recommendation:** Ensure that information on anticipated cost savings and payback times are clearly communicated during workshops and provide customers with appropriate case studies. Emphasize the lease option (or loans) to offset the upfront costs.
- **Recommendation:** Consider alternatives to point-of-use installations, such as community-shared solar, sometimes called community solar gardens, where a larger scale solar array is constructed on suitable and available land, and multiple customers buy-in to the array and proportionately benefit from the energy produced. Such alternatives would allow interested customers whose homes are not well-suited to participate and benefit from solar.

Conclusion: Some purchase interviewees stated receiving a realistic cost estimate was critical to give them the confidence to take the next steps in the installation process. They also felt it was necessary to do background research before contacting a solar trade ally for a site visit and cost estimate, which delayed getting the critical information they were ultimately looking for.

Conclusion: Some purchase interviewees expressed difficulties filing for the Oregon state tax credit because there was no clear place to claim the credit on the tax form. These interviewees said they had to contact a tax professional to file their taxes, whereas typically they would have filed themselves. The added cost of hiring a tax professional effectively made the tax credit of less worth.

- **Recommendation:** Engage in discussions with the Oregon Department of Energy to devise an approach to providing additional tax information for program participants to file for their solar tax incentive(s). Alternatively, consider providing information addressing common or general tax questions related to solar through the Energy Trust website or other marketing collateral, as appropriate.

Conclusion: Many program participants noted the ease of maintaining their systems as a benefit, which could be used as a selling point in marketing and outreach content. This may also be useful information for customers who are deciding between leasing and purchasing a system. Several lease customers said they had chosen to lease for the convenience of not having to conduct maintenance and repairs themselves.

- **Recommendation:** Consider adding messaging on the ease of maintenance as a selling point in program collateral and outreach.

Conclusion: Lease respondents most commonly cited their reasons for leasing and not purchasing were that it was more affordable and/or because purchasing the system was prohibitively expensive. The majority of lease participants who took the survey said they would have seriously considered purchasing if they had access to a loan that eliminated the upfront cost and had monthly payments that

were lower than utility bill savings. However, several lease interviewees who were interested in such a loan during the survey retracted during the follow-up interview, stating their new lack of interest in a solar loan product stemmed from concerns about the technology becoming obsolete, having to maintain the system, and a general disinterest in owning the system.

- **Recommendation**: Explore further the market's interest in a solar loan product and how it would differ from leasing. Given the conflicting results from the survey and interviews conducted, it is unclear if there is a strong demand for this product; however, due to the initial positive response received from lease survey respondents, we recommend a closer examination. Focus on critical characteristics such as loan length, interest rate, down payments, monthly payments, and the ability to re-amortize. A solar loan would likely need to be competitive with currently available loan offerings such as a home equity line of credit.
- **Recommendation**: Contact local and regional banks and credit unions to gauge their interest in offering a loan product for solar and to better understand any challenges or barriers that may currently prohibit them from offering such a loan product.

When asked how long they considered solar before moving forward with the installation, close to half of all respondents said one or more years. This suggests that these respondents who considered purchasing a system may have needed time to save money for the large upfront cost, and/or do their due diligence before making a purchase.

There were significantly more lease customers who participated in the program after just one to three months of consideration compared to purchase customers, suggesting the appeal of lower cost commitments and maintenance responsibilities. Additionally, installers utilizing the leasing model, such as SolarCity, who many survey respondents and interviewees named specifically, may have more active sales and marketing, generally making them more effective at moving customers through the installation process.

Customers who participated in the program said there were few challenges, but the ones most commonly mentioned related to upfront costs or the technical aspects of installation (e.g., roofing, tree shade, inspections).

The most prevalent advice among program participants and event attendees to others considering solar was to take action now to install the system before incentives are no longer available or are not as lucrative.

- **Recommendation:** Consider revising collateral material and the websites to introduce a sense of urgency by publishing testimonials from participant customers who can recommend that others act now.

Currently, some marketing materials inform customers about the benefits of solar and provide them with information on how to participate but do not actively encourage the customer to take the next step toward visiting the Energy Trust website or reaching out to a contractor for a cost estimate.

- **Recommendation**: Ensure that all collateral have clear calls-to-action that provide a customer with the next steps toward participation in the program.

Demographics

Conclusion: The majority of program participants and event attendees have bachelors or graduate or professional degrees and 61% of program participants have annual household incomes of $70,000 or above. The most common income group was $100,000 to $150,000.

Conclusion: Given the "zero money down" option that a lease can provide, Energy Trust may want to continue targeting households with annual incomes of $50,000 - $70,000, which is on the lower of end of the participants surveyed. Reducing utility costs for customers in lower income brackets will likely have a greater impact as a percentage of their discretionary income compared to customers in higher income brackets.