New Buildings Program

Final Report

August 9, 2018

Prepared by

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Executive Summary

Introduction

In December 2017, Energy Trust of Oregon (Energy Trust) selected Research Into Action to conduct market research to support their New Buildings program. This report presents the approach, results, and the implications of those results for the program.

Evaluation Objectives

This research considered the new construction market's full landscape of stakeholders, project scopes, and program phases (i.e., design, planning, installation, or completion). To capture this arc of activity, the research team focused on collecting the following information:

- The key characteristics, awareness, perceptions, barriers, motivators, and engagement of respondents, and
- Key aspects of the broader new construction market, including external market forces that come into play, presenting new barriers and opportunities, such as energy and building codes, emerging technologies, and economics.

We completed interviews with 90 respondents of which 63 provided details about the Energy Trust's high priority group – those with experience using Early Design Assistance, Market Solutions, Modeling Assistance, or Path to Net Zero. Most respondents were commercial building owners and developers who do work across Oregon in varying building types. About half are experienced both with the new construction market and with the program through participation in multiple projects.

Data collection occurred from late April 2018 through early June 2018. Interviews lasted, on average, about 35 minutes and ranged from 20 – 60 minutes.

Program Effects

Many market actors are highly engaged with the program.

The program successfully attracts and engages a large portion of the market through outreach. Many respondents are repeat customers and program offerings adapt to meet the needs of many different customers.

Early involvement of Energy Trust representatives enhances participation.

Participants often involve program representatives in their projects, which both makes participation smoother and helps design teams consider energy efficiency early in the process.

Program training is a valuable resource for some.

About one-third of all respondents (31%) attended Energy Trust-sponsored trainings. Almost all who did valued their training. Respondents attended classroom-based training, lunch-and-learns sponsored by Energy Trust, and site-visits with Energy Trust representatives.

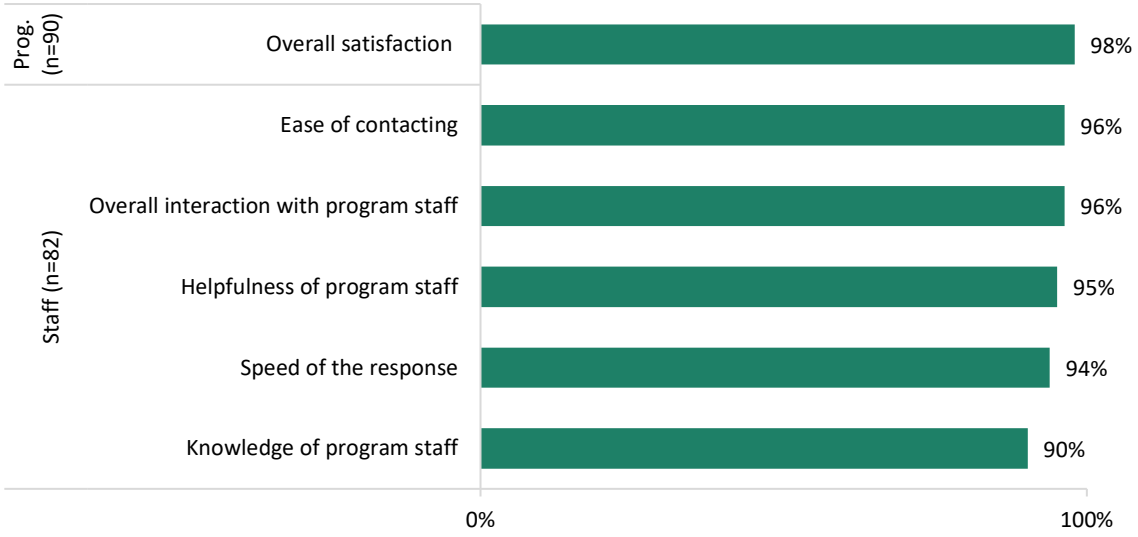
The program influences renewable energy decisions.

Many New Buildings respondents consider renewable energy (51%) and the program plays an important role in supporting and influencing public and private respondents to consider renewable measures. The program influences renewable energy decisions by helping verify and clarify plans for renewables and helping offset the cost of the overall bill for analysis and installation.

Participant satisfaction is very high.

Respondents reported high levels of satisfaction with the program overall and with their interactions with staff (Figure ES-1).

Figure ES-1: Satisfaction with Overall Program and Staff



Market Insights

Financial motivations, particularly savings on operations and maintenance costs, motivate program participants.

Almost all respondents noted some financial motivation. Improved building performance and quality, and a commitment to social and environmental responsibility, also are important motivations for many respondents (44% each).

Participants cited four key barriers to investing in energy efficiency.

Cost, while the single most frequent barrier, is not the only barrier to constructing efficient buildings. While upfront cost was the most frequent barrier, respondents described other key factors that prevent owners from constructing efficient buildings, including concerns about new or untested equipment, the extra time need to build an efficient building, and lack of knowledge among building owners about efficiency benefits.

The energy code does not play a major role in most project decisions.

Changes in energy code directly affected some respondents (39%), largely related to increases in the amount of time it takes to do a new project. The remaining 61% said code considerations do not? noticeably change their work because they are often unaware of code changes or because they already build above energy code (7). Forty-eight respondents noted that other members of the design team – typically architects – keep abreast of code changes but it is not a major consideration in design.

Insights About Program Offerings

Early Design Assistance helps participants consider new green technologies.

A third of respondents noted that Early Design Assistance allowed them to consider new energy efficient and “green” technologies or measures they would not have considered without the assistance. Measures included changes to the building shell and installation of electric vehicle charging stations.

Participants lauded many aspects of Early Design Assistance.

They specified that the offering provided them:

- An opportunity to collaborate and build relationships across the design team.
- Face-to-face time with program staff.
- Exposure to new ideas.
- Verification that they are on the right path for their project.
- Receiving incentive money to support the cost of the assistance meeting.
- Time to better understand the program requirements.

The easy-to-follow path of Market Solutions makes it invisible to some and appealing to others.

Less than half of the 22 interviewed respondents that knew they participated in an Energy Trust project, could recall they participated in the Market Solutions offering, even when prompted with reminders about the tiers and workbooks. Those who recalled the path said they were highly satisfied and said it was important that it offered an easy-to-follow way to construct a more efficient building.

Participants appreciated Modeling Assistance because it helps verify and adjust designs.

The 11 respondents offering details about the modeling assistance said it is important for verifying and adjusting design, but that they did not use it to make wholesale changes. Some also appreciated the new ideas that modeling brought to their projects.

Path to Net Zero participants tend to be mission driven.

Of the 17 respondents, almost all (15) elected to take the Path to Net Zero (PTNZ) offering due to the mission of their organization or, in the case of a developer, the mission of their client. The majority of these mission-driven organizations were public entities (13) such as school districts (6) or entities (7) like health centers, fire departments, and courthouses.

PTNZ's non-monetary support is an important influence on design.

Of the 15 respondents able to report about how the PTNZ offering influenced their project, almost all (14) noted how the non-monetary influences of PTNZ influenced their project compared to about a third mentioning the monetary incentives.

Staying within a project budget presents a key challenge to net zero projects.

Of those who described encountering challenges to constructing net zero buildings (13), most (12) expressed that it was difficult to meet the budget demands.

PTNZ respondents cited high satisfaction and many benefits to participation.

Respondents said the program:

- Provided them a path to follow to achieve high efficiency
- Helped support the mission of their organization
- Helped convince others about benefits of efficiency
- Will provide them with long-term financial savings
- Built awareness about efficiency for future projects.

Conclusions and Recommendations

Conclusion 1: The New Buildings program offers a suite of offerings that appeals to a broad cross-section of the market. From building owners and developers interested in a single measure, to those interested in net zero construction, all have clearly laid out paths and support, including appropriate incentive levels tailored to each path. This has allowed Energy Trust to reach roughly half of all new

commercial projects in its territory and develop a cadre of owners and professionals that are highly satisfied with the program.

Conclusion 2: Offering multiple program offerings allowed respondents to find a path that works for them. For example, Market Solutions offers less knowledgeable and experienced participants an easy and convenient way, with the certainty of specific incentive amounts, to increase the energy efficiency in their projects. Path to Net Zero offers highly motivated participants a path to achieve their - objectives. This makes the program convenient and familiar, but also may encourage repeat customers to stay in the path they know, even if they might be able to pursue greater efficiency. Energy Trust representatives almost act as de facto members of design teams, especially on more complicated projects, and these representatives may be able to take steps that effectively influence progress toward higher efficiency for future projects.

> **Recommendation 1:** Investigate ways to work with past participants to try even higher efficiency for future projects. This encouragement could occur during the system-based project as outreach managers could begin laying the groundwork with these respondents about more efficiency work they could do in their next building. Similarly, a highly satisfied Market Solutions respondent might be encouraged to try using the top tier offering or even pursue a net zero approach on their next building.

Conclusion 3: Respondents see verification of energy efficiency design and measures as a critical benefit of the program. Respondents from all program offerings identified, to varying degrees, the value they received from having their ideas verified by the program. It was important to many respondents that a third party, Energy Trust, was verifying the designs and measures they wanted to install to meet their efficiency objectives.

> **Recommendation 2:** Along with messages about incentives and technical support, ensure that marketing materials include messaging about the value the program can offer to help verify designs and ideas.

Conclusion 4: The construction professional community is critical to program awareness and use. Those who participate in the program's training opportunities highly value their training experiences, and greater participation in trainings could be another conduit for positive word of mouth about the program.

> **Recommendation 3:** Continue to seek opportunities to engage potential participants – both those working for professional services firms and building owners -- via trainings, including lunch-and-learn sessions, formal classroom training, and updates about program updates.

Conclusion 5: Roughly half the new commercial buildings in Energy Trust territory are not going through the New Buildings program. This research with participants cannot shed light on who and what types of buildings are not participating. However, this is an important consideration for future program expansion.

> **Recommendation 4:** Further exploration of the program's database, plus market research with nonparticipants and "market experts" could provide further insights for expanding the program's reach into new construction and major renovation market.

Conclusion 6: This research exposed topics to explore in the next round of market research.

Recommendation 5: For the next round of market research consider:

- Interviewing modelers to get a more complete understanding of the successes and challenges associated with the program's modeling assistance.
- Ask respondents about any projects they have done that did not go through the program, even when they were aware of the program or had used it in the past, to better understand if participants selectively use the program, or if the program is consistently applied to all their projects. Furthermore, this line of questioning could confirm that once participants find an offering that meets their need, they tend to stay in that offering for future projects.
- In future market penetration analysis work, examine if smaller projects are being missed by the program and if so, consider ways to attract smaller projects.

MEMO

Date: December 31, 2018
To: Board of Directors
From: Jessica Iplikci , New Construction Senior Program Manager
Susan Jowaiszas, Marketing Lead Energy Programs
Phil Degens, Evaluation Manager
Subject: Staff Response to the 2018 New Construction Market Research

Energy Trust wanted to take a closer look at participants in the New Buildings program that had utilized specific program services within the past year, 2017. Past research studies largely focused on completed projects and customers that had been engaged with the program over multiple years. Focusing the research on more recent participation in a wider range of program services, such as early design assistance, can provide more timely feedback to program managers on the current offerings and customer experience.

The market research indicated that the program has a maintained a large share of the new construction market. The program also continues to attract new participants in a very active and competitive commercial real estate market. The market strategy where code follows practice is proving to be successful as most respondents had few if any code-related issues.

The program's early engagement strategy has led many customers to consider more energy efficiency and renewable energy options in their projects. Path to Net Zero participants responses indicated that participants in that track were becoming more comfortable with this design approach and doing additional Path to Net Zero projects.

New Buildings has been encouraging repeat participation resulting in customers taking a comprehensive approach to efficiency and renewable energy generation in their projects. Program managers are considering how to maintain savings momentum by both enrolling more projects and achieving deeper savings where customers have the desire.

Training and education have grown over the past several years as a tool for the program to engage with architects, designers and engineers, and support their capacity to design high-performance buildings in Oregon. This investment is proving to be an effective strategy to build understanding of the value of energy efficiency and renewable energy with building owners and developers.

1. Introduction

In December 2017, Energy Trust of Oregon (Energy Trust) selected Research Into Action to conduct market research to support their New Buildings program. This report presents our approach, the results, and the implications of those results for the program.

1.1. Program Description

The commercial new construction and major renovation market is complex and constantly evolving. Energy Trust has served this market through its New Buildings program ("the program") for more than a decade. Energy Trust and its program management contractors (PMCs), have evolved the program to respond to market changes. The overall program intends to advance the market for high-performance and net zero design and construction throughout Oregon.

The current program offers both educational resources (e.g., the Allies for Efficiency training series) and direct project assistance and incentives. Its four major offerings, listed below, are designed to align with an integrated design process and the various needs of key market actors:

- Early Design Assistance: Provides a $2,500 incentive for design charrette.
- Market Solutions: Provides a package of efficiency measures, suited to a specific industry.
- Modeling Assistance: Provides up to $50,000 for technical assistance with energy modeling and can be higher if respondent also elects to participate in the Path to Net Zero offering.
- Path to Net Zero (PTNZ): Provides a suite of services and incentives to help owners achieve a net zero energy target.

1.2. Overall Evaluation Approach

This research captures and documents relevant insights on program respondents and their projects, as well as on exogenous factors that shape their journey through the program. Research Into Action gathered information from program documentation and data, as well from in-depth telephone interviews with program participants. Respondents could be owners/developers, architects and designers, engineers, design-build firms, contractors, or owner representatives/construction managers, but all had decision-making roles in program projects. Because commercial new construction and renovation often involves multiple actors, a single decision-maker did not necessarily know about all aspects of program participation.

This research considered the new construction market's full landscape of stakeholders, project scopes, and program phases (i.e., design, planning, installation, or completion). To capture this arc of activity, the research team focused on collecting the following information:

- The key characteristics, awareness, perceptions, barriers, motivators, and engagement of respondents across the following program offerings, and

- Key aspects of the broader new construction market, including external market forces that come into play, presenting new barriers and opportunities, such as energy and building codes, emerging technologies, and economics.

The project focused on answering 15 research questions. Seven of these questions applied to all respondents, while the relevance of the remaining questions depended on the offerings in which respondents had participated. The longest interviews were with PTNZ respondents, who typically had the deepest involvement with program services (Table 1-1).

Table 1-1: Research Questions by Program Offerings

Research Questions	System Based	Market Solutions	Modeling Assistance	Early Design Assistance	PTNZ
Who are the key market actors?	✓	✓	✓	✓	✓
What are the key opportunities and challenges within the market?	✓	✓	✓	✓	✓
Does program participation differ across Energy Trust's service area?	✓	✓	✓	✓	✓
What role does code play?	✓	✓	✓	✓	✓
How is the program addressing current market needs?	✓	✓	✓	✓	✓
What is the customer journey (from awareness to enrollment and participation)?	✓	✓	✓	✓	✓
What are customer perceptions, needs, and levels of satisfaction regarding the program?	✓	✓	✓	✓	✓
How do customers view the program's support with solar PV in projects? Does program support increase the uptake of solar/solar-ready design?	✓	✓	✓	✓	✓
What types of design features were considered?			✓	✓	✓
What are the outcomes of the Early Design Assistance?					
Design features that were pursued?			✓	✓	
What were the reasons for selecting specific design features?					
Satisfaction with this offering			✓	✓	✓
Suggestions on how the offering could be improved (e.g., changes or additions, timing)			✓	✓	✓

Research Questions	System Based	Market Solutions	Modeling Assistance	Early Design Assistance	PTNZ
What efficiency and renewables features are currently being pursued (for active projects) or were installed (for completed projects)? What was the decision process for selecting these features?					✓
What benefits do architects, engineers, and similar professionals see the program providing in the future? What challenges are they hoping to overcome in achieving high-performance and net zero energy buildings?					✓
Satisfaction questions per regulatory requirements	✓	✓	✓	✓	✓

This research placed a special emphasis upon understanding the experience of respondents who took advantage of the most complex and sophisticated services the program offers, namely the Early Design Assistance, Market Solutions, Modeling Assistance, and Path to Net Zero approaches.

The interview guide addressed each research question and can be seen in Appendix A.

2. Methods

2.1. Database Review

Research Into Action's review of the program database revealed there were 686 unique active (259) or completed (427) projects in 2017. Slightly less than half (45%) of all projects received one of the program offerings and almost all those used Early Design Assistance (EDA). Very few projects enrolled in the PTNZ (8%) or took advantage of Modeling Assistance (4%). Table 2-1 provides an overview of all projects in 2017 by the offerings associated with the projects. It shows both the number of projects and the number of contacts associated with each offering.

Table 2-1: Active and Completed Projects Across Tracks and Program Offerings

	Total Projects		Total Contacts	
Offering	Count	% of Total	Count	% of Total
System-Based	378	55%	358	58%
Market Solutions	118	17%	111	18%
Modeling Assistance	29	4%	31	5%
Early Design Assistance	302	44%	279	45%
Path to Net Zero	56	8%	48	8%
Total	**686**	**100%**	**617**	**100%**

2.2. Disposition and Fielding Goals

Some respondents had worked on multiple projects and could answer questions about their experience with more than one offering. Furthermore, some projects—particularly those that are more complex—have multiple contacts, and we were able to speak with multiple representatives about their experience with the same project(s). Some respondents also provided new contacts to consider who were not on the original list. The disposition summary thus has 622 contacts (see Table 2-2), as opposed to the 617 listed in Table 2-1

Table 2-2: Disposition Summary

Disposition	Count
Eligible	**352**
Complete	90
Attempted but not contacted	258
Unavailable during data collection period	4

Disposition	Count
Unknown Eligibility	**270**
Duplicates	11
Missing or bad contact data	35
Contact not available (left job, deceased)	11
Not passed screening	4
Subsample quota filled	209
Total	**622**

Our original goal was to interview 70 high priority respondents – those with experience using Early Design Assistance, Market Solutions, Modeling Assistance, or Path-to-Net Zero – and up to 40 with experience conducting lower priority – system based - projects. We met those goals by completing 72 interviews with respondents that indicated they had experience with high priority program offerings at the outset of the interview. However, only 63 of these respondents were able to follow through with details about those offerings when the interviewer reached that battery of questions (Table 2-3).

Table 2-3: Desired Completes and Actual Completes

Track		Desired Completes	Experience with	Provided details in interview
Low-Priority	System Based	30-40	61	39
Priority Group	Any High Priority	70	72	63
	Early Design Assistance (EDA)	Not specified	61	49
	Modeling Assistance (MA)		29	11
	Market Solutions (MS)		22	10
	Path to Net Zero (PTNZ)		24	17
	Total Respondents	**Up to 110**	**90**	

Interviewers asked respondents to verify that the information in the program database about their project's participation was correct and that they could speak to their experience with that offering. Owners and developers often referred interviewers to the design professionals they worked with for more specific experience with program offerings, or felt the specific offering was so well integrated into the overall project as to make it difficult to address a specific aspect of the program separately.

The research team paid close attention to which project types respondents represented throughout the data collection period to ensure they achieved the desired number of completes. While some contacts may have had experience with three or more tracks and offerings, the team only asked about two offerings to keep the interview time to a reasonable level.

Data collection occurred from late April 2018 through early June 2018. Interviews lasted, on average, about 35 minutes and ranged from 20 – 60 minutes. Interviewers used an online questionnaire system to log all responses to each question. This system made it possible to code and analyze responses using *MS Excel*.

3. Program Experience

This chapter explores the following aspects of respondents and their experience with the program, including their:

- Characteristics
- Engagement with the program
- Awareness and use of program training
- Use of renewable energy in their projects
- Overall satisfaction with the program

3.1. Respondent Characteristics

Most respondents were commercial building owners and developers who work across Oregon. About half are experienced both with the new construction market and with the program through participation in multiple projects across multiple building types. Table 3-1 provides more detail on respondents' roles in New Buildings projects, the regions they serve, and their experiences with new construction projects and the New Buildings program. Specifically, it shows that Market Solutions (MS) respondents had less construction experience than others and on average, they were more likely to be owners/developers. Of all respondents, most of the owners planned to occupy the buildings they enrolled in the program, rather than developing them for, or to sell to another party.

Table 3-1: Respondent Characteristics by Program Offering

	Systems Based (n=27)	EDA (n=49)	MS (n=10)	MA (n=11)	PTNZ (n=17)	Total (n=90)
Respondent Role						
Owner (n=74)	**89%**	**80%**	**90%**	**64%**	**65%**	**82%**
Building Owner	59%	61%	80%	55%	65%	63%
Owner/Developer	22%	18%	10%	9%	0%	17%
Owner/Tenant	7%	0%	0%	0%	0%	2%
Design Team (n=16)	**11%**	**20%**	**10%**	**36%**	**35%**	**18%**
Owner representative	4%	10%	0%	36%	29%	10%
Architect	4%	10%	10%	0%	6%	7%
Contractor	4%	0%	0%	0%	0%	1%
Designer	0%	0%	0%	0%	0%	0%

	Systems Based (n=27)	EDA (n=49)	MS (n=10)	MA (n=11)	PTNZ (n=17)	Total (n=90)
Region						
All work in Portland metro	44%	37%	30%	45%	47%	40%
All work outside metro area	26%	41%	30%	27%	24%	33%
Mix of Portland area and outside Portland area	30%	22%	40%	27%	29%	27%
Involvement in New Construction Market						
Less than one year	7%	6%	0%	0%	6%	6%
1 - 3 years	11%	12%	30%	0%	12%	13%
4 - 6 years	4%	12%	30%	0%	6%	8%
7 - 9 years	4%	4%	10%	18%	6%	6%
10 or more years	63%	49%	20%	64%	53%	53%
Did not consider themselves involved in new construction market	11%	16%	10%	18%	18%	14%
Number of New Buildings Projects						
1 project	52%	45%	50%	27%	47%	47%
2-3 projects	11%	22%	10%	18%	18%	17%
4-5 projects	15%	10%	10%	27%	12%	10%
6-7 projects	4%	10%	20%	9%	12%	11%
8 or more projects	15%	10%	10%	18%	12%	13%
Building Types Experience						
Multifamily	19%	35%	80%	36%	18%	32%
Office	30%	22%	20%	27%	12%	24%
Government	7%	20%	0%	9%	29%	17%
Retail	22%	12%	30%	9%	6%	14%
Healthcare	7%	12%	10%	18%	18%	12%
School	0%	10%	10%	36%	29%	10%
Hospitality/restaurants	7%	12%	0%	9%	0%	9%
Mixed use	4%	10%	10%	0%	6%	7%
Industrial	11%	4%	0%	0%	0%	6%
Higher education	4%	6%	0%	9%	6%	6%
Recreation	11%	0%	0%	0%	6%	4%
Warehouse/Manufacturing	7%	2%	0%	0%	6%	3%

	Systems Based (n=27)	EDA (n=49)	MS (n=10)	MA (n=11)	PTNZ (n=17)	Total (n=90)
Labs	4%	4%	0%	0%	0%	3%
Church	0%	2%	0%	0%	0%	1%

3.2. Engagement with the Program

Program information and respondents revealed information about program awareness, the roles of key market actors, and respondents' use of program offerings. Additionally, design team professionals described what they consider when offering the program to their clients. The picture that emerges in this section is of a program that reaches a large portion of the market and flexes and adapts to meet the needs of many different customers.

Program Awareness

Respondents reported that they learned about the program through their networks in the design and construction community and through direct, personal contact with program representatives. About 60% of all respondents (58% of owners and 69% of design team professionals) noted learning about the New Buildings program via interactions within their networks, such as architects and colleagues, and about a third mentioned personal program outreach and past experience with Energy Trust. Far fewer respondents recalled learning about the program via their own research or program advertising, although advertising likely plays a supportive role (8%) in how respondents hear about the program.

Market Solutions respondents reported learning about the program via direct program contacts more than other respondents (60% versus 35%), which suggests program staff play a critical role in getting respondents to use that offering (Table 3-2). While this is a qualitative assessment, several Market Solutions respondents noted their Energy Trust representative by name and indicated that representative was instrumental in raising their awareness of Market Solutions.

Table 3-2: How Respondents Heard about New Buildings

Source	MS (n=10)	Non-MS (n=80)	Total (n=90)
Owner/Designer Community	**70%**	**60%**	**60%**
Contractor, architect	40%	30%	30%
General industry knowledge	0%	15%	19%
Coworkers, and unspecified word-of-mouth	20%	13%	11%
Client	10%	8%	7%
Direct Program Outreach	**60%**	**35%**	**34%**
Outreach contact	60%	34%	33%
Through personal participation in residential program	0%	1%	1%

Source	MS (n=10)	Non-MS (n=80)	Total (n=90)
Research and Advertisements	**10%**	**13%**	**11%**
Online ads	10%	6%	6%
Marketing emails	0%	6%	6%
Looking for grants	0%	1%	1%
Don't know	**0%**	**6%**	**6%**

The program has successfully reached a large share of the new buildings market in Oregon over the last few years. Energy Trust and its program implementers reached about half (48%) of new buildings projects in Energy Trust territory from 2014-2016 and slightly more than half (58%) from 2012-2014.[1]

Program Considerations

Most participating design team professionals offer the New Buildings program to all their clients but some are more selective in how they promote the program. The majority (59%) of the 17 design team professionals we interviewed present the program to most, if not all, of their clients (Table 3-3). Those who offer the program more selectively (24%) say they may not bring it up with for certain types of projects – such as those with quick project turnarounds, concerns about payback, and time and resource constraints. Design team professionals are more likely to offer the program if the client expresses interest in sustainability. As one respondent noted, "The client was interested in LEED®[2] and sustainability, so we told the client about the incentives."

Table 3-3: Design Team Professionals Presentation of the New Buildings Program to Clients (n = 17)

Response	Count	Percent
Offer it to all clients	9	53%
Offer it to most - unless the project is very small	1	6%
Offer Selectively	4	24%
Don't know	3	18%

[1] New Building Market Saturation, Andy Griguhn, October 2017. Internal Energy Trust memo received at January 2018 kick-off meeting. The market saturation estimate was based on analysis of the Dodge Market data on new buildings and the Energy Trust New Buildings project database.

[2] USGBC Leadership in Energy and Environmental Design

Market Actor Roles

The early involvement of Energy Trust representatives across all project types (e.g., whole-building, systems-based, etc.) makes participation smoother and helps design teams consider energy efficiency early in the process. Many respondents (60%) report they involve a program representative early on in the participation process, sometimes almost as a part of the design team. As one respondent noted, "*I brought the Energy Trust representative to the design committee*."

> *"We convened the sustainability team and decided what we wanted to accomplish on this project and it was suggested that we get Energy Trust looped in… Having Energy Trust at the meeting made things easier. We knew what we were trying to accomplish and how it could fit in the Energy Trust programs. That made that process a lot easier. The customization was possible with Energy Trust sitting at the meeting."*

The owner's representative, architect, contractor, or builder are often important liaisons between the building owner and Energy Trust. Many building owners and developers (31%) noted that one of their design team members handled many of the day-to-day aspects of program participation. One building owner noted, "*Basically, I just filled out the paperwork and answered questions needed to proceed. Then the Energy Trust representative worked with our contractor. I was on the sideline*."

Many found Energy Trust easy to work with and the process straightforward, with less than one-fifth (18%) of respondents reported any challenges to using the program. The majority of respondents (73%) volunteered that Energy Trust was easy to work with and the process was straightforward. As one owner representative stated, "*It's been so easy, it's almost hard to describe.*" This may be because most respondents were building owners and designers, some of whom (31%) mentioned that they delegated things like paperwork and communicating with Energy Trust to their contractors.

> *"I don't think it's particularly difficult [to participate]. I think having a consultant that drives that process for us obviously makes it easier. But, they're basically filling out apps, sending stuff in, getting info from our construction guys. It's not like its complicated stuff that we couldn't do, having one group responsible for that stuff just makes it easier."*

The few challenges mentioned included the desire for more clarity about program requirements (three mentions) and the timing of incentives (two mentions).

Use of Program Offerings

Respondents who have completed multiple Energy Trust projects tend to use the same offering. Most repeat respondents do not progress from one project path to other paths. For instance, no Market Solutions respondents reported also participating in PTNZ for example. Various factors play into respondent decisions to stick with the same offering. For example:

- One government entity that typically has a similar type of new construction project happening every year, noted that they had never used Energy Trust assistance prior to about three years ago. In that three years, this respondent has started or completed three New Buildings projects, all using the PTNZ offering.

- A Market Solutions respondent noted that all their projects have used that offering because it is an easy-to-follow path that gets them increased incentives over single measure incentives.
- Another Market Solutions respondent implied they would continue to use that path and not use the PTNZ path because that path was too difficult for them to complete – they did not elaborate about what was too difficult.
- PTNZ respondent owners are mission-driven to continue to pursue net zero construction and continue to choose the PTNZ offering. As one nongovernmental PTNZ respondent noted, completing their recent project was "consistent with our mission" and they are looking do more PTNZ projects in the future.

3.3. Awareness, Use, and Satisfaction with Training Received

About one-third of respondents attended Energy Trust-sponsored trainings, with almost all valuing the experience. Half of all design team professionals (8) and a quarter of all owners (19) recalled participating in Energy Trust trainings; all but one owner's representative found the training valuable.

Of those who participated in training, 23 specified the type of training they attended.

- Most (19) recalled a classroom-type training with a person delivering a presentation.
- Three received lunch-and-learn trainings where an Energy Trust representative provided a presentation for the respondent and their colleagues
- Three received training on-site where an Energy Trust representative explained a design feature to professionals in the field
- Two noted in-person visits or meetings where an Energy Trust representative discussed topics with the respondent one-on-one
- One respondent noted partaking of Energy Trust-sponsored breakfast meeting sessions.

Five of the 23 respondents specified topics they found valuable. Four valued the trainings about the program and the updates about programs changes. One non-profit housing agency building owner and one architect valued trainings that helped satisfy their professional continuing education credit requirements.

Examples of what respondents liked about trainings included:

- Learning about new technologies that have been successfully installed in other sites, so they can use that information to convince decision makers to try new technologies
- Learning about the range of programs and services available through Energy Trust so they can use those services for future work
- Adding to their professional network of facilities staff, designers, and other professionals in the building industry

The one respondent who did not find value in the trainings suggested they had attended an incorrect training for their needs.[3]

3.4. Awareness and Use of Renewables

Many New Buildings respondents consider renewable energy. About half of all respondents (46) reported considering solar (45) or geothermal (3) equipment as part of their New Buildings project. These respondents represented both public (21) and private organizations (25).

Energy Trust plays an important role in supporting and influencing public and private respondents to consider renewable measures but its direct influence on the actual installation of renewable equipment is less clear. Of those who considered renewables, about half (25) reported Energy Trust influenced their renewable equipment decisions. More respondents from public agencies than those from private entities noted that Energy Trust helped validate their ideas about using renewable energy. More private entities noted they had not considered renewable energy prior to working with Energy Trust (Table 3-4).

Table 3-4: Energy Trust Influence on Renewable Equipment Decisions

	Public	Private	Total
Verified/clarified renewable energy ideas	8	4	12
Offset cost enough to pursue	5	6	11
Had not considered solar prior to involvement with Energy Trust	1	5	6
Unspecified influence	2	2	4
Total	**12**	**13**	**25**

Energy Trust influences decisions related to renewable equipment in the following ways.

- Twelve respondents noted how Energy Trust helped clarify or adjust pre-existing plans to install renewable energy equipment. While most owners reported the feasibility analysis they did with Energy Trust support aided their decision to proceed with on-site renewable energy, a couple of respondents noted that the analysis revealed that on-site renewable energy would be challenging. One school representative noted that the Energy Trust study revealed they did not need renewables to achieve their energy use intensity (EUI) target, but they still expressed interest in installing renewables. A respondent from a city government noted that the Energy Trust technical assistance showed that their site did not have enough sun exposure to support

[3] This respondent stated that a "handful" of sessions they attended in Eastern Oregon were mostly residential in focus. This respondent focuses on large government and school building projects, so the topics were not relevant. The respondent also noted that the poor sound quality made it difficult to understand the session.

roof-top solar. Having that study in hand allowed them to apply for an exemption from the state that requires public entities to spend on green energy technology.[4]

- Eleven respondents reported that the Energy Trust financial assistance offset the cost of renewables enough that they could consider pursuing renewables. One respondent specified that knowing that incentives would cover one-third of the solar cost (studies and installation costs) allowed them to pursue solar. Another appreciated the incentives for the solar-ready approach because it helps organizations take a step towards solar and represents "good long-term planning" on the part of Energy Trust.
- Six respondents stated that they would never have considered solar for their project without Energy Trust's assistance, five of whom represented private entities. One respondent stated Energy Trust's support "encouraged us to look at solar" and that a grant from Portland General Electric (PGE) for construction sealed their decision to install solar.

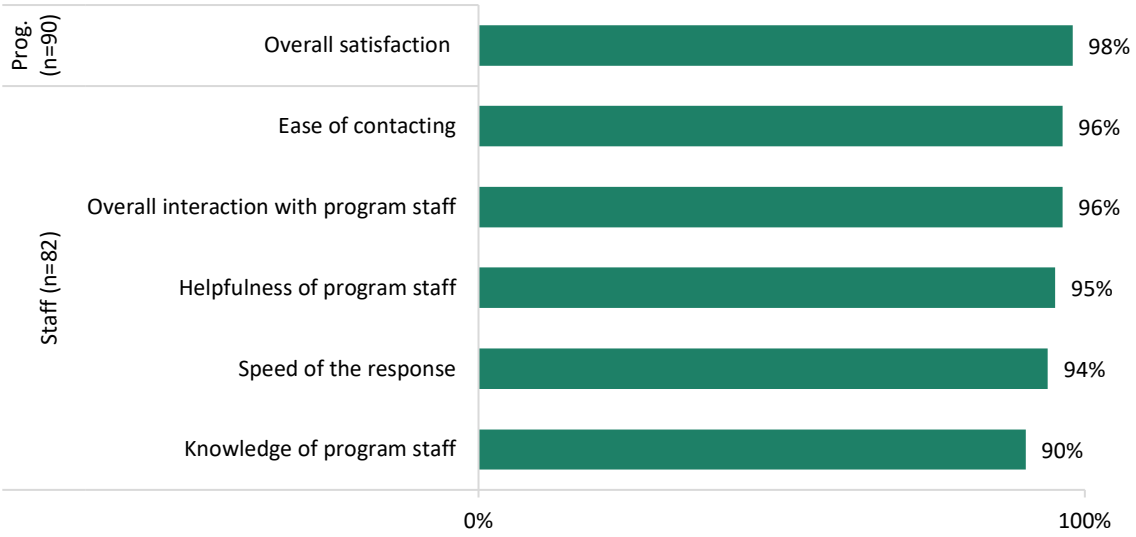
A little less than half (21) of those considering renewable energy reported that Energy Trust did not influence their decision to install solar. State requirements that public entities consider renewable energy or an organization's overarching mission tended to be the most important influencing factors among these respondents.

3.5. Program Satisfaction

Respondents reported high levels of satisfaction with the program overall and with their interactions with staff. Almost all respondents were satisfied with the program overall. Respondents who interacted directly with staff were highly satisfied with how easy it was to reach them, the speed with which they responded, their helpfulness, and their knowledge.

[4] The State of Oregon (ORS 279C.527) states that a public body such as cities and school districts will spend 1.5% of the total contract price of a building on green energy technology (GET). GET includes solar, geothermal, and woody biomass energy technology.

Figure 3-1: Satisfaction with Overall Program and Staff*



* The data for program data show the percent of respondents who reported they were "somewhat satisfied" (20%) or "very satisfied (78%)". The data for staff ratings show the percent of respondents who selected a 4 or 5 on a scale where 1 represented "not at all satisfied" and 5 was "highly satisfied."

Respondents were also highly satisfied with the individual program offerings, which subsequent sections address in further detail.

4. New Construction Market

Respondents provided details on their experience in and perspectives on the broader new construction market, including key decision makers in new construction projects, motivations and barriers to constructing energy-efficient buildings, and the effects of changing energy codes.

4.1. Decision Makers

Owners, developers, top executives, or boards are the key decision makers for New Buildings projects. They often bring in a design team, including architects, engineers, and other development professionals to advise them. Most respondents (81%) reported that the building owners or executives had the primary decision-making power. Many (32%) also reported that the owners often consult industry professionals to aid them in their decision making.

4.2. Motivations to Construct Energy-Efficient Buildings

Saving money, largely through operations and maintenance (O&M) savings, is a key motivation of building owners to invest in energy-efficient buildings. The reasons to invest do not differ noticeably between those who did more complex, holistic projects and those who exclusively did systems-based projects. Respondents most commonly cited financial motivations as their reason for investing in efficiency with almost all respondents noting some financial motivation. Improved building performance and a commitment to social and environmental responsibility also are important motivations for many respondents (44% each). (Table 4-1). Respondents with system based only projects were more likely than other respondents to cite high quality equipment as a motivation (30% to 10%).

Table 4-1: Motivations to Invest in Energy Efficiency (Multiple responses allowed)

Motivations to Invest in Energy Efficiency	EDA, MS, MA, PTNZ (n=63)		System Based Only (n=27)	
	Count	Percent	Count	Percent
Financial	**56**	**89%**	**25**	**93%**
Reduced operations and maintenance costs	35	56%	19	70%
General long-term savings	18	29%	5	19%
Incentives	13	21%	6	22%
Reduced energy bills	12	19%	2	7%
Performance	**18**	**29%**	**12**	**44%**
Tenant savings, comfort, satisfaction	10	16%	3	11%
High quality equipment (longer lifespan, noise reduction, lifecycle costs)	6	10%	8	30%
High quality and performing building	5	8%	1	4%

Motivations to Invest in Energy Efficiency	EDA, MS, MA, PTNZ (n=63)		System Based Only (n=27)	
	Count	Percent	Count	Percent
Social and environmental responsibility	**38**	**60%**	**12**	**44%**
Mission, strategic plan or organization prioritizes social and environmental responsibility	32	51%	10	37%
Public perceptions/Appeal to social and environmental responsibility	8	13%	4	15%
Assistance from Energy Trust	**3**	**5%**	**1**	**4%**
State Requirements	**3**	**5%**	**0**	**0%**

4.3. Barriers to Constructing Energy-Efficient Buildings

Cost, while the single most frequent barrier, is not the only barrier to constructing efficient buildings. Upfront cost was the largest single barrier respondents cited; however, they gave a long list of other factors that also prevent owners from constructing efficient buildings. This list included concerns about using new untested equipment, the extra time it may take to build an efficient building, and the lack of knowledge about the benefits of efficiency. Table 4-2 summarizes the barriers respondents discussed, and the subsequent bullets provide more detailed descriptions and examples related to barriers.

Table 4-2: Barriers to Investing in Energy Efficiency (n=88)

Barriers	EDA, MS, MA, PTNZ (n=63)		System Based Only (n=27)	
	Count	Percent	Count	Percent
Financial concerns	**56**	**90%**	**20**	**78%**
Upfront costs	51	81%	18	67%
Short term thinking	9	14%	4	15%
Payback not sufficient	7	11%	3	11%
Lack of knowledge about benefits of efficiency	**21**	**33%**	**7**	**26%**
Equipment concerns	**19**	**30%**	**7**	**26%**
Uncertainty about new technology	16	25%	4	15%
Availability of materials or knowledgeable contractors	1	2%	3	11%
Technical limitations	2	3%	1	4%
Decreased comfort	1	2%	0	0%

Barriers	EDA, MS, MA, PTNZ (n=63) Count	EDA, MS, MA, PTNZ (n=63) Percent	System Based Only (n=27) Count	System Based Only (n=27) Percent
Time necessary to construct efficient building	**14**	**22%**	**3**	**11%**
Bureaucracy	7	11%	1	4%
Competing priorities	6	10%	1	4%
General time concern	3	5%	1	4%

- **Financial concerns:** Respondents generally discussed challenges associated with the perceived incremental costs of constructing an efficient building. One respondent noted how, even if they wanted to build an efficient building, they might have to forego certain features or equipment because they do not have the money to cover the initial cost. Other financial concerns related to owners' short-term thinking about the savings they could realize if they invested upfront, and the payback period being too long.
- **Lack of knowledge about the benefits of efficiency:** Many respondents noted how some building owners may not know how efficiency could benefit them or their business. For example, one respondent noted how some owners may scoff at a 20-year payback for a certain measure even though they could still financially benefit from that measure after 20 years.
- **Equipment concerns:** Some respondents expressed concerns about using new and untested efficient equipment, including:
  - Uncertainty about the new technology's ability to deliver the savings as promised
  - Uncertainty if new materials would be available or have contractors trained to install the new measures
  - Concerns with technical limitations such as fitting efficient equipment into small spaces.
  - Concerns that efficient equipment may lead to decreased comfort. For example, one respondent with experience constructing net zero buildings noted how some of the net zero characteristics of the building led to the perception of reduced comfort among the building occupants.
- **Time necessary to construct efficient buildings.** A minority of respondents expressed concern that constructing an efficient building would take too much time because of the bureaucracy associated with going through programs that encourage efficiency (Energy Trust, LEED, and others) and competing priorities such as conducting other principle aspects of their business.

4.4. The Role of Energy Code

Changes in energy code directly affected a minority of respondents, largely related to increases in the amount of time it takes to do a new project. About two-fifths of respondents (35) mentioned how changes in energy code affect their work. The remaining 55 indicated that code does not noticeably change their work because someone else on their team was responsible for tracking it (48) or because they were already building above energy code (7).

Of those 35 who provided examples of the effects of code changes, most noted that the changes demand more of their time. Code changes require them to devote time to things such as identifying materials or techniques to be code compliant and explaining code changes to clients and staff. Furthermore, implementing code changes can slow down a project because construction workers may not be as familiar with new equipment and techniques.

Of all 90 respondents, half (45) noted how they stay aware of energy code changes and almost all (39) noted they rely on design professionals such as architects and engineers. Other resources included Energy Trust (5), government agencies (5), and trade publications (2).

5. Feedback on Program Offerings

This chapter explores respondents' perspective about their experiences with specific program offerings, beginning with Early Design Assistance.

5.1. Early Design Assistance

Forty-nine respondents provided details on how the Early Design Assistance offering influenced their projects, what challenges and benefits they experienced using the offering and their suggestions for improving it.

Influence of Early Design Assistance on Design

Almost a third of respondents noted that EDA allowed them to consider new "green" technologies or measures they would not have without the assistance. Sixteen of the 49 respondents with Early Design Assistance experience noted specific measures identified during the design assistance phase of their project that likely would not have occurred without the assistance. The measures varied from building shell changes to electric vehicle charging stations.

Challenges and Benefits to Using Early Design Assistance

Respondents liked many things about Early Design Assistance, and they reported no notable challenges to using the program offering. Thirty-four respondents noted six aspects of early design assistance they particularly liked:

- **Opportunity to collaborate and build relationships** across the design team. This collaboration allows members of the design team to do things like get questions answered about new technologies. One respondent stated, "It gave us a jump start to get everyone together and gave us an idea of what was being installed and why." (12)
- **Face-to-face time with program staff**. As one respondent stated, "The [Energy Trust] representative was well rounded in the salient issues, so we did not jabber about things that were not going to work." (11)
- **Exposure to new ideas**. These new ideas could be about tangible things like new measures or convincing a building owner to think more about the long-term cost of building ownership than the short-term installation costs (8).
- **Verification of ideas that EDA provides.** Respondents appreciated that EDA helps them verify that they are on the right energy efficiency path for their project (5).
- **Receiving incentive money** to support the meeting (4).
- **Knowing the requirements of the program.** One respondent said, "The best feature of early [design] assistance is to start a project with the end in mind and [Energy Trust is] very clear

about what is required to achieve incentives." A Market Solutions respondent also stated how it was helpful that the program staff reviewed the Market Solutions workbook with the design team during the early design assistance meeting (4).

Early Design Assistance Improvements

Almost all respondents were "very satisfied" with their EDA assistance, with only a few respondents suggesting ways to improve the offering. Ninety percent (44) reported they were somewhat (6) or very satisfied (38) with the program offering and six respondents suggested the following ways Energy Trust could improve Early Design Assistance.

- Send reminders to the design team about the meeting and any milestones associated with the assistance (2).
- Consider having multiple design meetings instead of one. There can be a lot of information to digest in one meeting (1).
- Provide documentation of the EDA meeting to all attendees (1).
- Provide more long-term predictive information about savings during the early design assistance meetings (1).
- Research more about any measures they are marketing and identify potential pitfalls to the measure. This respondent had a bad experience with a specific measure that had been supported by Energy Trust and was wishing Energy Trust had not influenced them to install the measure until it had been better vetted. (1)

5.2. Market Solutions

Ten respondents shared how the Market Solutions offering influenced their projects, what challenges and benefits they experienced using Market Solutions and their suggestions for improving the program offering.

Influence of Market Solutions on Design

The Market Solutions offering and the tools embedded in the offering (i.e., the calculator and tiers) were often invisible to respondents. As noted in Table 2-3, 22 respondents had projects that went through Market Solutions and they recalled doing work with Energy Trust; however, less than half (10) could recall that they participated in that path. Among those 10, only three were familiar with the calculator workbooks and seven could report about how the different tiers encouraged them to choose more energy efficient offerings than if the offerings did not exist.

Market Solutions respondents said it was important that the path provided an easy-to-follow way to construct a more efficient building. Of the 10 respondents who could report about Market Solutions, eight noted that the participation path was easy to follow, and/or they received great service from their program representative that encouraged participation. For example, one respondent, a multifamily property owner, noted that their Energy Trust representative suggested the Market Solutions path when

they indicated interest in doing more efficiency work than they had in past projects, and two respondents noted that the participation pathway appeared easy to follow from the outset and encouraged them to do more efficiency work.

Other reasons they elected to participate were:

- Higher incentives over the standard path (5).
- One respondent noted that the higher incentives combined with the improved aesthetics of the higher efficiency equipment made the difference to them. This multifamily property owner respondent implied that in the past, some high efficiency fixtures and appliances did not have the "modern and nice" look they wanted for their properties.
- Another respondent appreciated that the path was "all-inclusive" and allowed them to look at how measures interrelated with one another to maximize savings.

Challenges and Benefits to using Market Solutions

The tiers embedded in the Market Solutions offering encouraged respondents to choose more energy-efficient offerings than they would have otherwise. The clear explanations of the tiers made following the path easy (5 mentions), and the larger incentives supported their interest in efficiency (3 mentions). One owner respondent suggested that their firm wants to choose the most energy-efficient offering and that the top tier gives them something to aim for. This respondent explained one challenge they experienced achieving the highest tier incentive. According to this respondent, the low-flow aerators and showerheads frustrate tenants but to achieve the highest tier that equipment is necessary. This respondent would like another choice to achieve the highest tier.

Market Solutions Improvements

Market Solutions respondents were very satisfied with the offering, and few had suggestions for improving the Market Solutions path. Nine of the ten respondents reported they were very satisfied (8) or somewhat satisfied (1) with the Market Solutions offering. One suggested offering financing to help pay for some of the measures and another suggested having lists of specific equipment that qualify for each tier.

5.3. Modeling Assistance

Eleven respondents told us about how the Modeling Assistance offering influenced their projects, what challenges and benefits they experienced using Modeling Assistance and their suggestions for improving the program offering.

Influence of Modeling Assistance on Design

Many respondents could not offer details about the modeling assistance offering. Of the 29 respondents whose projects included modeling assistance, only 11 could speak to the details of modeling because they had only a small involvement with it. Eighteen suggested at the beginning of the

interview that they were knowledgeable about modeling, but when interviewers asked the respondent about the modeling assistance later in the interview, it became clear in several cases that the respondent did not know many details about the service offering. For example, when asked how the modeling assistance helped with decision making, one owner/developer stated the modeling work was somewhat invisible to them. This individual said their modeling work had recently concluded and the engineer and Energy Trust "haven't really involved me a lot" in the modeling work.

Modeling assistance typically serves to verify plans and expose adjustments in design that can better serve the goal of creating an energy efficient building. All 11 respondents offering details about the modeling assistance noted that it allowed them to verify or adjust their designs, but that it did not influence wholesale changes. For example, one respondent stated that modeling helps "confirm decisions already made" and another respondent noted that modeling "confirmed or clarified the design to meet the EUI target." One of these respondents reported that modeling helped them make specific equipment decisions because they could see how different equipment affected the model and another respondent noted that modeling helped them forecast their operating expenses, which helped them make more informed decisions about what designs to keep or change.

Challenges and Benefits to using Modeling Assistance

Almost all respondents were very satisfied with the modeling assistance; albeit most respondents had little direct involvement with the assistance. They gave varied reasons for what they <u>most</u> appreciated about it. Seven respondents appreciated outcomes resulting from their participation.

- Six identified the verification and adjustment of their design as the best aspect of the modeling. Three respondents provided additional details:
  - Two appreciated the independence of the modelers and the fact they that serve as a third-party check on the architect's design.
  - One appreciated the addition of new ideas that modeling can bring to the overall design.
- One most appreciated the operating expense predictions.

Two respondents most appreciated programmatic processes:

- One most appreciated that the incentive largely covered modeling costs, and implied that modeling would not have occurred without the incentive.
- One appreciated that the modeling procedures fit well into the overall timeline of the project.

Modeling Assistance Improvements

All respondents reported high satisfaction with the Modeling Assistance offering and had few suggestions for how to improve modeling. Ten respondents reported being "very satisfied" and one reported being somewhat satisfied with modeling assistance. A few (4) respondents implied that modeling was a time-consuming process and anything Energy Trust can do to expedite processes or improve communications during the modeling phase would be helpful. It is possible that if interviewers had talked to more engineers, they may have been able to provide greater details here.

5.4. Path to Net Zero

Seventeen respondents discussed how the PTNZ offering influenced their projects, what challenges and benefits they experienced using PTNZ, and their suggestions for improving the program offering.

Influence of PTNZ Program Offering on Design

PTNZ respondents are largely mission-driven to build a net zero energy building. Of the 17 respondents, almost all (15) elected to take the PTNZ path due to the mission of their organization or, in the case of a developer, the mission of their client. The majority of these mission-driven organizations were public entities (13) such as school districts (6) or entities (7) like health centers, fire departments, and courthouses. Two respondents noted pursuing a net zero building because it made business sense to them – that is the financial benefits outweighed any perceived downsides to pursuing net zero (Table 5-1).

Table 5-1: Organization Type by Rationale for Participating in PTNZ (n=17)

	Mission	Made Business Sense	Total
Public Entities	13	0	13
Non-school (recreation, health ctr, courthouse)	*7*	*0*	*7*
School	*6*	*0*	*6*
Mixed Use	0	1	1
Multifamily	1	0	1
Industrial	1	1	2
Total	**15**	**2**	**17**

PTNZ respondents most often cite the program's non-monetary support as influencing their design, rather than monetary incentives. High incentives associated with the PTNZ offering influenced respondents to follow a net zero path, but not as much as the verification, easy to follow path, and new ideas the PTNZ offering provides. Of the 15 respondents able to report about how the PTNZ offering influenced their project, almost all (14) noted how the non-monetary influences of PTNZ influenced their project whereas only about a third referenced monetary incentives as a key influence (Table 5-2).

Table 5-2: How PTNZ Influenced Project (n=15)

Influence	Count
Non-monetary influence	**14**
Help verify EE decisions	10
Provide path to follow to achieve EE	3
Provide EE topics and offerings to consider	3

Influence	Count
Monetary influence	**6**
Provide money for energy efficient equipment and labor	6

Respondents reported keeping most energy-efficient measures that they considered at the project outset. Of the 17 respondents, the majority (14) implied using the major design features they considered for their project. Three noted they did not install some of the design features they initially considered and provided specific examples, including:

- Rigid insulation and electronic windows
- Solar and some elements of their HVAC system
- An energy management system.

Most PTNZ respondents (16) reported considering solar or solar ready projects, and two pursued geothermal measures.

Challenges and Benefits to Constructing Net Zero Buildings

Many respondents noted challenges constructing net zero buildings, most often related to staying within project budgets. Of those who described encountering challenges (13), most (12) expressed that it was difficult to meet the budget demands of a net zero building. A couple of building owners elaborated about the importance of setting budget expectations with the design team early in the project because designers may see the net zero goal as a way to build "their flagship" project, thus making the project more expensive than necessary.

Another challenge involved general coordination with the design team. The complexity of net zero design and construction warrants a higher-level of communication and collaboration among team members (e.g., architects, engineers, contractors, etc.) than a standard project.

Respondents also noted that it was difficult to convey to laypeople such as school boards, elected officials, and community groups why net zero is important and why the upfront costs could be more expensive than building to code. As one respondent noted, they had to educate their elected officials about the benefits that would come from spending $100,000 for solar.

Siting a building on a property can also be a challenge. According to three respondents, orienting the building to maximize daylighting exposure can be a problem if there are large obstructions nearby and siting enough solar panels on a small parcel can also pose problems to reaching the net zero target (Table 5-3).

Table 5-3: Summary of Challenges Associated with Constructing a Net Zero Building (n=17)

Challenge	Count
Any challenge	**13**
Meeting budget requirements	12
Coordination with design team	4
Conveying Net Zero concept to laypeople	4
Siting issues (placement on the property)	3
Sourcing proper efficient equipment	1
No challenge	**4**

Respondents noted many benefits to constructing a net zero building through the program, both benefits associated with the outcomes of the process and with program-specific services. These benefits included having a path to follow to achieve a net zero building, serving the mission of the organization constructing the building, and assistance in convincing others about the benefits of a net zero building. They also noted tangible program benefits—specifically, the financial incentives and services such as the early design and modeling assistance (Table 5-4).

Table 5-4: Benefits Associated with Constructing Net Zero Buildings via the Program (n=17)

Benefit	Count
Outcome Benefits	**16**
Having a path to follow to achieve EE	9
Serves mission of the organization	6
Convincing or educating others about EE benefits	5
Long-term financial savings	4
Building awareness for future projects	3
Program Specific Benefits	**13**
Incentives	10
Modeling assistance	2
Early design assistance	2
Receive International Living Future Institute (IFLI) Certification	1

PTNZ Program Improvements

Satisfaction was high among PTNZ respondents, with a few suggestions how to make the program offering even stronger. Fourteen noted they were very satisfied, and two reported being somewhat satisfied with the program offering. Six respondents provided suggestions to improve PTNZ.

- An architect reported wishing there were more services for small buildings.
- A respondent representing a higher education facility expressed difficulties finding an appropriate solar contractor and would have liked help from Energy Trust in identifying solar contractors.
- An owner's representative suggested increasing the amount of communication during the design process. According to this respondent, keeping track of some of the details necessary for the program can be difficult, and they rely on Energy Trust to prompt them for the necessary paperwork.
- An owner's representative suggested providing a menu of services for potential respondents.
- An owner developing a property for their tenants suggested increasing the incentive amounts, but they did not provide details.
- A respondent representing a government suggested a more streamlined approach to the paperwork and data Energy Trust requires of owners.

6. Conclusions and Recommendations

Conclusion 1: The New Buildings program offers a suite of offerings that appeals to a broad cross-section of the market. From building owners and developers interested in a single measure, to those interested in net zero construction, all have clearly laid out paths and support, including appropriate incentive levels tailored to each path. This has allowed Energy Trust to reach roughly half of all new commercial projects in its territory and develop a cadre of owners and professionals that are highly satisfied with the program.

Conclusion 2: Offering multiple program offerings allowed respondents to find a path that works for them. For example, Market Solutions offers less knowledgeable and experienced participants an easy and convenient way, with the certainty of specific incentive amounts, to increase the energy efficiency in their projects. Path to Net Zero offers highly motivated participants a path to achieve their high efficiency objectives. This makes the program convenient and familiar, but also may encourage repeat customers to stay in the path they know, even if they might be able to pursue greater efficiency. Energy Trust representatives almost act as de facto members of design teams, especially on more complicated projects, and these representatives may be able to take steps that effectively influence progress toward higher efficiency for future projects.

> **Recommendation 1:** Investigate ways to work with past participants to try even higher efficiency for future projects. This encouragement could occur during the system-based project as outreach managers could begin laying the groundwork with these respondents about more efficiency work they could do in their next building. Similarly, a highly satisfied Market Solutions respondent might be encouraged to try using the top tier offering or even pursue a net zero approach on their next building.

Conclusion 3: Respondents see verification of energy efficiency design and measures as a critical benefit of the program. Respondents from all program offerings identified, to varying degrees, the value they received from having their ideas verified by the program. It was important to many respondents that a third party, Energy Trust, was verifying the designs and measures they wanted to install to meet their efficiency objectives.

> **Recommendation 2:** Along with messages about incentives and technical support, ensure that marketing materials include messaging about the value the program can offer to help verify designs and ideas.

Conclusion 4: The construction professional community is critical to program awareness and use. Those who participate in the program's training opportunities highly value their training experiences, and greater participation in trainings could be another conduit for positive word of mouth about the program.

> **Recommendation 3:** Continue to seek opportunities to engage potential participants – both those working for professional services firms and building owners -- via trainings, including lunch-and-learn sessions, formal classroom training, and updates about program updates.

Conclusion 5: Roughly half the new commercial buildings in Energy Trust territory are not going through the New Buildings program. This research with participants cannot shed light on who and what types of buildings are not participating. However, this is an important consideration for future program expansion.

> **Recommendation 4:** Further exploration of the program's database, plus market research with nonparticipants and "market experts" could provide further insights for expanding the program's reach into new construction and major renovation market.

Conclusion 6: This research exposed topics to explore in the next round of market research.

> **Recommendation 5:** For the next round of market research consider:
>
> - Interviewing modelers to get a more complete understanding of the successes and challenges associated with the program's modeling assistance.
> - Ask respondents about any projects they have done that did not go through the program, even when they were aware of the program or had used it in the past, to better understand if participants selectively use the program, or if the program is consistently applied to all their projects. Furthermore, this line of questioning could confirm that once participants find an offering that meets their need, they tend to stay in that offering for future projects.
> - In future market penetration analysis work, examine if smaller projects are being missed by the program and if so, consider ways to attract smaller projects.

Appendix A. Interview Guide

A.1. Screening [ASK ALL]

[ASK ALL]

S1. First of all, can you confirm that your organization recently participated in Energy Trust of Oregon's New Buildings Program – that is that you received incentives or assistance from Energy Trust to design or install energy efficient systems in your new building? [If needed: This could have been financial incentives such as money for a product or could have been technical assistance such as support for energy modeling or a design charrette.]

[SINGLE RESPONSE]

[*Do not read*:]

1. Yes
2. No [ASK IF THERE IS SOMEONE ELSE THAT CAN HELP, IF NOT THANK AND TERMINATE]
98. Don't know [THANK AND TERMINATE]
99. Refused [THANK AND TERMINATE]

[ASK ALL]

S2. To verify, we understand you have experience with [SEE CALL LIST TO ID PROGRAM FAMILIARITY] Are you familiar with any other program offerings?

[*Read list*]

[*The boxes will be checked for the tracks and options they have experience with based on the program data. Interviewer: If the respondent has experience with other tracks and options, please select here. If needed: provide a brief description to the respondent about each of the program offerings because the respondent may not think about the offerings by the names we list here.*]

Program Offerings	
1. System Based (Provides incentives for single measures or systems)	❑
2. Early Design Assistance ($2,500 incentive for design charrette)	❑
3. Modeling Assistance (Provides up to $50,000 for technical assistance with energy modeling)	❑
4. Market Solutions (Provides a package of efficiency measures, suited to a specific industry)	❑
5. Path to Net Zero (Provides a suite of services to help owners achieve a net zero energy target)	❑

A.2. Introduction

My first few questions are about your role in your company. So to start….

[ASK ALL]

Q1. Which of the following best describes your role in the design and construction process?

[SINGLE RESPONSE]

1. Building owner or developer
2. Owner Representative
3. Design Professional (e.g., architect, engineer, or energy analyst)
4. Green Building/sustainability consultant
5. Contractor (e.g., general contractor or specialty contractor involved in construction)
6. Other_____

[ASK IF Q1 ≠ 1]

Q2. What type of company do you represent?

[MULTIPLE RESPONSE]

1. Architecture Firm
2. Engineering Firm
3. General Contractor
4. Design-Build Firm (Involved in design through construction phase))
5. Commercial Developer
6. Building owner
7. Other_____

[ASK ALL]

Q3. What is your job title at your organization?

1. [OPEN-ENDED RESPONSE]

[ASK ALL]

Q4. How long have you been in your current position?

[SINGLE RESPONSE]

[*Do not read*:]

1. Less than 1 year
2. 1-3 years
3. 4-6 years
4. 7-9 years
5. 10 or more years
98. Don't know
99. Refused

[ASK ALL]

Q5. How long have you personally been involved in the commercial new construction market?

1. [OPEN-ENDED RESPONSE]

[ASK ALL]

Q6. Briefly, what are your key roles as they pertain to working with Energy Trust?

1. [OPEN-ENDED RESPONSE]

For the next few questions, please answer based on your experience over the last year.

[ASK ALL]

Q7. What type of buildings have you worked on with the New Buildings program in the last year? [If needed: Is it office space, retails, schools, etc.]

[MULTIPLE RESPONSE]

[*Do not read, probe to code:*]

1. Office
2. Retail (shops, grocery, car dealer)
3. School
4. Warehouse
5. Multifamily
6. Government/Institution
7. Industrial
96. Other, please specify: [OPEN-ENDED RESPONSE]
97. Not applicable
98. Don't know
99. Refused

[ASK ALL]

Q8. What other building types have you worked on?

[MULTIPLE RESPONSE]

[*Do not read, probe to code*:]

1. Office
2. Retail
3. Grocery
4. School
5. Warehouse
6. Multifamily
7. Industrial
96. Other, please specify: [OPEN-ENDED RESPONSE]
97. Not applicable
98. Don't know
99. Refused

[ASK ALL]

Q9. What portion of all your new commercial construction work in the U.S. is in …?

[*Interviewer: These values should add to 100%.*]

[NUMERIC RESPONSE]

1. Portland metro area (Multnomah, Washington, Clackamas Counties) [FORCE NUMERIC RESPONSE]
2. Other areas in Oregon [FORCE NUMERIC RESPONSE]
3. Other areas outside Oregon [FORCE NUMERIC RESPONSE]

A.3. Experience with New Commercial Construction

The next several questions are about the market for new commercial buildings in Oregon.

Q10. Who are the key decision makers in new building projects you worked on and what are their key roles? [*If needed: Key decision makers may be an architect, building owner, corporate headquarter staff, or someone else.*]

1. [OPEN-ENDED RESPONSE]

[ASK IF Q1 ≠ 1, NOT A BUILDING OWNER]

Q11. What do you think motivates building owners to invest in energy efficiency? [*If needed: Is it demand from potential tenants, long term energy savings, etc. EE is defined as designing buildings to and specifying equipment that goes beyond code requirements.*]

1. [OPEN-ENDED RESPONSE]

[ASK IF Q1= 1, BUILDING OWNER]

Q12. What motivates you to invest in energy efficiency in your buildings? [*If needed: Is it demand from potential tenants, long term energy savings, etc. EE is defined as designing buildings to and specifying equipment that goes beyond code requirements.*]

1. [OPEN-ENDED RESPONSE]

[ASK ALL]

Q13. What prevents owners [IF Q1=1 "Such as yourself"] from constructing energy efficient buildings? [*If "lack of interest," or "higher cost" ask "anything else?" If needed: Is it the time needed to design an efficient building compared to a code built building? Is it a lack of equipment availability? Is it a lack of trained professionals to help with design and construction? Something else? EE is defined as designing buildings to and specifying equipment that goes beyond code requirements.*]

1. [OPEN-ENDED RESPONSE]

[ASK IF Q1 ≠ 1, NOT A BUILDING OWNER]

Q14. Under what circumstances do you find owners less interested in energy efficiency?

1. [OPEN-ENDED RESPONSE]

[ASK ALL]

Q15. When building energy code changes, how does it affect your work?

1. [OPEN-ENDED RESPONSE]

[ASK IF Q1 ≠ 1, NOT A BUILDING OWNER]

Q16. What resources do you use to keep up with code?

1. [OPEN-ENDED RESPONSE]

A.4. Experience with the Program

The next set of questions concern your experience with the New Buildings program, including your level of familiarity and satisfaction.

[ASK ALL]

Q17. When did you first learn about Energy Trust's New Buildings program?

[SINGLE RESPONSE]

1. Less than 1 year
2. 1-3 years
3. 4-6 years
4. 7-9 years
5. 10 or more years
98. Don't know
99. Refused

[ASK ALL]

Q18. How did you first learn about the New Buildings program?

[*Do not read, probe to code*:]

[MULTIPLE RESPONSE]

1. Outreach contact from Program
2. Client
3. Online
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]

Q19. How long ago did you first participate in Energy Trust's New Buildings program?

[SINGLE RESPONSE]

1. Less than 1 year
2. 1-3 years
3. 4-6 years
4. 7-9 years
5. 10 or more years
98. Don't know
99. Refused

[ASK ALL]

Q20. How many Energy Trust New Buildings projects have you been involved in?

[SINGLE RESPONSE]

1. 1 project
2. 2-3 projects
3. 4-5 projects
4. 6-7 projects
5. 8 or more projects
98. Don't know
99. Refused

[ASK IF Q1 ≠ 1, NOT A BUILDING OWNER]

Q21. Do you talk about Energy Trust of Oregon programs with all clients who are eligible or do you offer it more selectively? How do you present the Energy Trust program to your clients?

1. [OPEN-ENDED RESPONSE]

[ASK ALL]

Q22. Can you walk me through how you participated in the program – how did it start and then what happened next? What steps were the easiest and worked the best? Which were more challenging (and why)?

1. [OPEN-ENDED RESPONSE]

[ASK ALL]

Q23. Have you ever attended training or educational events sponsored by Energy Trust? How useful were those events to you and why?

1. [OPEN-ENDED RESPONSE]

[ASK ALL]

Q24. What renewable energy sources, if any, have you included as part of your Energy Trust project(s)?

[MULTIPLE RESPONSE]

1. Solar/Solar Ready
2. Geothermal
3. Wind power
96. Other, please specify: [OPEN-ENDED RESPONSE]
97. None, not applicable [MAKE EXCLUSIVE]
98. Don't know
99. Refused

[ASK IF Q24 = ANY, RENEWABLE ENERGY SOURCES INCLUDED]

Q25. How satisfied were you with the assistance you received for installing renewables?

1. [OPEN-ENDED RESPONSE]

[ASK IF Q24 = ANY, RENEWABLE ENERGY SOURCES INCLUDED]

Q26. How, if at all, did program support influence your plan to include renewable energy design in your building?

1. [OPEN-ENDED RESPONSE]

A.5. Path to Net Zero (PTNZ) [S2_5=1]

Now I'd like to ask you some questions more specifically about your projects that went through the Path to Net Zero offering. Through this offering you qualified for enhanced early design and technical assistance incentives, as well as additional program support and incentives by committing to a net zero or near net zero target at the project kick-off.

[ASK IF S2_5 =1]

Q27. Why did you [or your client] choose to participate in PTNZ? Who was involved and what were their roles? [*If needed: Had you already chosen to pursue PTNZ but wanted assistance to lower the cost? Were you exploring PTNZ as option? Something else?*]

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_5=1]

Q28. How, if at all, did the PTNZ assistance influence the design? What aspects of the process were most valuable to you? (*Probes: Early Design Assistance, Modeling (Technical) Assistance, Incentives*)

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_5=1]

Q29. Were there any major design features considered but not used in the end? Why?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_5=1]

Q30. What renewable features are currently being pursued (for active projects) or were installed (for completed projects)?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_5=1]

Q31. What are the challenges in buildings a net zero building? How did the program help you overcome these challenges, if at all?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_5=1]

Q32. What do you see as the primary benefit of the PTNZ offering?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_5=1]

Q33. Did you receive or are you planning to receive net zero certification from the International Living Future Institute (ILFI)? How important was the incentive from Energy Trust in seeking IFLI certification? [*If needed: ILFI certifies buildings after a 12 month performance period. To receive certification, the building must achieve certain sustainable benchmarks such as lower than normal energy and water consumption*.]

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_5=1]

Q34. How satisfied are you with your experience with PTNZ? Would you say you are….

1. Not at all satisfied
2. Somewhat dissatisfied
3. Somewhat satisfied
4. Very satisfied

[*Do not read*:]

98. Don't know
99. Refused

[ASK IF S2_5=1]

Q35. What, if anything, did you most appreciate about the PTNZ assistance you received?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_5=1]

Q36. What, if anything, could be improved about the PTNZ assistance you received?

1. [OPEN-ENDED RESPONSE]

A.6. Early Design Assistance [ASK IF S2_2=1]

Now I'd like to ask you some questions about Early Design Assistance. This is the $2,500 incentive you received from Energy Trust to hold an early design meeting or charrette.

[ASK IF S2_2 =1]

Q37. Were there any key features identified in the design charrette that you had not considered previously? What were those features?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_2 =1]

Q38. Which features did you end up pursuing?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_2 =1]

Q39. Why did you end up selecting those design features?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_2 =1]

Q40. How satisfied are you with your experience with Early Design Assistance?

1. Not at all satisfied
2. Somewhat dissatisfied
3. Somewhat satisfied
4. Very satisfied

[*Do not read*:]

98. Don't know
99. Refused

[ASK IF S2_2 =1]

Q41. What, if anything, could be improved about the early design assistance?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_2 =1]

Q42. What, if anything, did you like best about the early design assistance you received?

1. [OPEN-ENDED RESPONSE]

A.7. Modeling Assistance [ASK IF S2_3=1]

Now I'd like to ask you some specific questions about Modeling Assistance. This is the assistance Energy Trust provided to you to conduct your detailed study about efficient options available for your project. The Modeling Assistance incentive covered up to 75% of the cost of the study, up to $50,000.

[ASK IF S2_3 =1]

Q43. How did the modeling assistance from Energy Trust help you make decisions about the building's design, systems, or equipment? [*If needed: such as passive heating and cooling, highly efficient systems, renewable energy systems?*] Did it verify certain assumptions? Did it expose new ideas you had not considered? How so?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_3 =1]

Q44. How satisfied are you with your experience with Modeling Assistance, on a scale from 1 to 5 where 1 is not at all satisfied and 5 is very satisfied?

1. Not at all satisfied
2. Somewhat dissatisfied
3. Somewhat satisfied
4. Very satisfied

[*Do not read*:]

98. Don't know
99. Refused

[ASK IF S2_3 =1]

Q45. What, if anything, did you most appreciate about the modeling assistance you received?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_3 =1]

Q46. What, if anything, could be improved about the modeling assistance you received?

1. [OPEN-ENDED RESPONSE]

A.8. Market Solutions [ASK IF S2_4=1]

Now I'd like to ask you some questions more specifically about your projects that went through the Market Solutions offering. This assistance from Energy Trust provides owners with a package of offerings specific to an industry (e.g. retail, restaurant) and provides tiered incentives.

[ASK IF S2_4 =1]

Q47. Why did you [or your client] choose to participate in the Market Solutions offering of the New Buildings program?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_4 =1]

Q48. How if at all, did the Market Solutions tiers, encourage you to choose the more energy efficient option?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_4 =1]

Q49. How helpful was the calculator in your decision to choose the market solutions track? [*If needed: There is a calculator that estimates how much energy and money you will save by taking a specific track within Market Solutions*.]?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_4 =1]

Q50. How easy or difficult was the process of participating in Market Solutions? Was it understandable what you would be getting from participating? Were there any inconsistencies with what you understood you would need to do and what you had to do?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_4 =1]

Q51. How satisfied are you with your experience with Market Solutions, on a scale from 1 to 5 where 1 is not at all satisfied and 5 is very satisfied?

1. Not at all satisfied
2. Somewhat dissatisfied
3. Somewhat satisfied
4. Very satisfied

[*Do not read*:]

98. Don't know
99. Refused

[ASK IF S2_4 =1]

Q52. What, if anything, did you most appreciate about Market Solutions offering?

1. [OPEN-ENDED RESPONSE]

[ASK IF S2_4 =1]

Q53. What, if anything, could be improved about Market Solutions offering?

1. [OPEN-ENDED RESPONSE]

A.9. Satisfaction [ASK IF Q1 = 1 OR Q1 =2, BUILDING OWNER OR BUILDING OWNER REPRESENTATIVE]

We have a few quick short-answer questions about your satisfaction with the program to conclude our conversation and then we will be done.

[ASK IF Q1 = 1 OR Q1 =2, BUILDING OWNER OR BUILDING OWNER REP]

Q54. In the course of participating in the New Buildings Program, how often did you communicate with New Buildings program outreach manager? Would you say:

[SINGLE RESPONSE]

1. 0
2. 1-5 times
3. 6-10 times
4. 11-20 times
5. More than 20 times

[*Do not read*:]

98. Don't know
99. Refused

[ASK ALL]

Q55. And how satisfied were you with each of the following aspects of your communications with Energy Trust? Again, on a scale from 1 to 5, with 1 indicating “not at all satisfied” and 5 indicating “very satisfied”, please tell me how satisfied you were with: [If you did not have contact with staff, please let me know that is not applicable.]

[SCALE QUESTION]

1. The ease of contacting Energy Trust or the New Buildings Program

2. The speed of the response
3. How helpful program staff were
4. How knowledgeable program staff were
5. Your overall interaction with program staff

[ASK IF Q55_1 OR Q55_2 OR Q55_3 OR Q55_4 OR Q55_5 =1 OR 2, INDICATED ANY DISSATISFACTION]

Q56. Why were you dissatisfied with:

1. [ASK IF Q55_1= 1 or 2] The ease of contacting Energy Trust or the New Buildings Program [OPEN-ENDED RESPONSE]
2. [ASK IF Q55_2= 1 or 2] The speed of the response [OPEN-ENDED RESPONSE]
3. [ASK IF Q55_3= 1 or 2] How courteous program staff were [OPEN-ENDED RESPONSE]
4. [ASK IF Q55_4= 1 or 2] How knowledgeable program staff were [OPEN-ENDED RESPONSE]
5. [ASK IF Q55_5= 1 or 2] Your overall interaction with program staff [OPEN-ENDED RESPONSE]

[ASK ALL]

Q57. How would you rate your overall satisfaction with the program?

[SINGLE RESPONSE]

1. Not at all satisfied
2. Somewhat dissatisfied
3. Somewhat satisfied
4. Very satisfied

[*Do not read*:]

98. Don't know
99. Refused

[ASK ALL]

Q58. Why do you give it that rating?

1. [OPEN-ENDED RESPONSE]

A.10. Closing

We have just a few things to talk about in closing…

[ASK ALL]

Q59. How is the program doing in addressing the needs of the current new construction market? Do you have any recommendations for improvement? Are there any future trends that the program should be thinking about? [OPEN-ENDED RESPONSE]

For Reference for Q60: Responses from S2.

Program Offerings	
1. System Based (Provides incentives for single measures or systems)	❑
2. Early Design Assistance ($2,500 incentive for design charrette)	❑
3. Modeling Assistance (Provides up to $50,000 for technical assistance with energy modeling)	❑
4. Market Solutions (Provides a package of efficiency measures, suited to a specific industry)	❑
5. Path to Net Zero (Provides a suite of services to help owners achieve a net zero energy target)	❑

[ASK ALL]

Q60. Please tell us the name and contact information of any other respondents that may have experience with the project located at [PROJECTADDRESS_1]. [*Interviewer: Please record name, phone, email, and role of any contacts noted by the respondent. We are particularly interested in the others who may be knowledgeable about one of the program options the respondent in this interview could not speak about. For example, an architect may not know much about the engineering task of modeling*.]

1. [OPEN-ENDED RESPONSE]

Thank you for taking the time to complete this important interview! Have a great day!