Agenda

Conservation Advisory Council
Wednesday April 20, 2016 1:30 pm – 4:00 pm

Address:
421 SW Oak St., #300
Portland, OR 97204

1:30 Welcome, introductions

1:35 Announcements and Old Business *(discussion)*
Feb 2016 CAC minutes

1:40 Saving Energy in Cannabis Production *(information)*
Information from Production Efficiency on program efforts underway, projects to date and what we are seeing in the early stages of serving this new market.

1:55 Multi-family Windows Incentives *(discussion)*
Presentation of updated analysis of existing multifamily windows measures, and discussion of outcomes and recommendations.

2:30 Clean Electricity and Coal Transition Plan *(information)*
Overview of what is currently known about the implications of this new Oregon law on Energy Trust renewable and energy efficiency programs.

3:00 Smart Thermostats *(information)*
Staff will present evaluation results from a pilot to test cost effective energy savings from self-installed units in homes with gas forced-air furnaces.

3:30 New Buildings Regional Trainings and Education *(discussion)*
Staff will provide information on the evolution of the New Buildings regional education and training platform for market actors involved in building performance and system selection, including uptake, outreach and effects on projects from these efforts, and solicit CAC member input on next steps.

4:00 Public comment

4:15 Adjourn

The next scheduled meeting of the Conservation Advisory Council will be May 11, 2016.

Conservation Advisory Council Meeting Notes

February 10, 2016

Attending from the council:
Julia Harper, Northwest Energy Efficiency Alliance
Garrett Harris, Portland General Electric
Scott Inman, Oregon Remodelers Association
Andria Jacob, City of Portland
Don Jones, Jr., Pacific Power
Roger Kainu (for Warren Cook), Oregon Department of Energy
Don MacOdrum, Home Performance Guild of Oregon
Holly Meyer, NW Natural
Tyler Pepple, Industrial Customers of Northwest Utilities
Elaine Prause, Oregon Public Utility Commission

Attending from Energy Trust:
Mike Bailey
Kim Crossman
Phil Degens
Sue Fletcher
Jessica Iplikci
Susan Jowaiszas
Oliver Kesting
Steve Lacey
Spencer Moersfelder
Thad Roth
Kate Scott
Paul Sklar
Julianne Thacher
Katie Wallace
Peter West

Others attending:
Jeremy Anderson, WISE
Dave Backen, Evergreen Consulting
Mark Duty, Rogers Machinery
Carolynn Farrar, NW Natural
Keith Kueny, Community Action Partnership of Oregon
Brian Lynch, AESC
Mary Mann, Goose Hollow Windows
Alan Meyer, Energy Trust board
John Molnar, Rogers Machinery
Faye Rachford
Bob Stull, CLEAResult
Ed Wales
Becky Walker, CLEAResult

1. Welcome and introductions

Kim Crossman convened the meeting at 1:30 p.m. and reviewed the agenda. The agenda, notes and presentation materials are available on Energy Trust's website at: www.energytrust.org/About/public-meetings/CACMeetings.aspx.

2. Old business

The council approved the November meeting notes without comments or changes.

Kim: Energy Trust is searching for the next Executive Director. Applications are due on February 22. Please share the opportunity with your contacts.

3. 2015 Preliminary Annual Results

Peter West presented Energy Trust's 2015 preliminary annual results. Official results will be available in the 2015 Annual Report to the OPUC available on April 15, 2016.

Peter: 2015 results were robust across the board. We achieved 102 percent of our electric savings goal, 116 percent of our natural gas savings goal and 112 percent of our renewable

energy generation goal. We achieved goals in three out of four utility territories. We came close in PGE territory at 96 percent of goal as several large industrial projects in PGE territory shifted completion from 2015 to 2016.

Our electric savings peaked in 2012, plateaued for a few years, and are now slightly lower, as planned. 2015 gas savings were the highest ever.

The number of commercial and industrial Strategic Energy Management, SEM, participants has grown significantly. However, businesses participating in SEM were smaller on average in 2015 than in 2014, resulting in overall fewer savings.

We realized mid-2015 that our gas incentives were not sufficient to motivate Existing Buildings customers to take action, which had a negative impact on both gas and dual-fuel projects, especially in PGE territory. We raised incentives and this resulted in more projects, but more for 2016 than 2015. We now have a strong pipeline of Existing Buildings dual-fuel projects in PGE for 2016.

We achieved 78 percent of the goal for NW Natural territory in Washington. We believe this is because our commercial incentives were insufficient in this territory. Incentives in Washington work differently than in Oregon and are set by tariffs. This prevented us from increasing incentives in Washington. This has been corrected for 2016

For the renewable energy sector, savings were very strong for commercial and residential solar projects. In fact, 2015 was the largest year ever for solar installations with 1,800 projects compared to 1,300 projects in 2014. In recent years, solar equipment costs have dropped significantly. In addition, the Solar program received two national awards, including from the Harvard Kennedy School of Business for innovation and from the Interstate Renewable Energy Council for efforts to reduce the soft, or non-hardware, costs of solar installations.

As expected, the Other Renewables program closed four projects in 2015, including two hydropower projects and two biopower projects. Efforts continue in 2016 to engage irrigation districts to install hydropower systems.

Don Jones, Jr: How are goals set for Other Renewables?
Peter: Goals are based on a market characterization assessment and an assessment of known project proposals. Annual goals are based on the renewable energy sector's five-year strategic plan. Note that energy-efficiency budgets are set based on opportunity, but renewable energy budgets are fixed.

A few noteworthy achievements in 2015 included tighter budgeting and forecasting that resulted in an intentional reduction of cash reserves.

We saw the largest ever industrial gas project, which indicated an emerging opportunity for synergy with pollution control and water-saving efforts.

Two years ago, LEDs were a relatively small part of the residential market. In 2015, LEDs were 55 percent of bulbs installed in the residential Products program. LEDs represented 67 percent of bulbs installed in the industrial sector. In 2016, we expect even more lighting to be LEDs.

NEEA achieved 152 percent of its goal, largely due to updates to codes and standards for chargers.

We had 108,000 customer transactions, the most ever and 9 percent more than in 2014. This is especially noteworthy because we also launched a new IT system in 2015.

Elaine Prause: What accounted for the strong success in Cascade Natural Gas territory?
Kim: All programs put extra effort into achievement in Cascade Natural Gas territory, and almost all of them succeeded.

Alan Meyer: 108,000 seems like a lot of transactions. Is that possible?
Peter: Yes, many of the transactions are electronic.

Ed Wales: In light of rapid uptake in LED lighting and General Electric's recent announcement to stop manufacturing CFLs in 2017, does Energy Trust expect a new LED baseline anytime soon?
Peter: We are working now to understand this and the timing of it. The market is moving extremely quickly. One complicating factor is non-ENERGY STAR® certified "value" LEDs are entering the market. The baseline is expected to shift radically between 2017 and 2020.
Mike: It's clear this change will happen, but the timing is difficult to pin down.
Kim: The question of when LED becomes baseline will also be sector specific. For example, while 67 percent of industrial lighting savings in 2015 were from LEDs, we have seen data showing less than 10 percent market penetration of LEDs in industrial high bay applications.

Peter thanked the Conservation Advisory Council, utilities, regulators, Program Management Contractors, Program Delivery Contractors and staff for contributing to these outstanding results.

4. Multifamily windows incentive changes update

Kate Scott, multifamily program manager, presented an update on changes to incentives for multifamily windows. In 2015, Energy Trust revisited all electric measures regarding cost-effectiveness. It was determined that windows for multifamily buildings of five dwelling units or more were no longer cost-effective. We decided to change duplex, triplex and fourplex incentives to align with single-family windows measures.

Since the Conservation Advisory Council meeting in November 2015, staff consulted several multifamily trade allies and attended January trade ally forums around the state to further engage stakeholders.

At this point, the program is still gathering data. Potential exceptions will be discussed with the OPUC shortly. Next month, Kate will return to the Conservation Advisory Council to present final changes and share out assumptions and reasoning. Formal changes are expected to be effective on July 1, 2016.

Scott Inman: What changes are you considering?
Kate: Our initial proposal was to discontinue windows incentives for all large multifamily (5 or more units) buildings. We're now looking at ways to save some subsets of the measure. For example, single-pane aluminum windows with project costs under $20,000 come closest to cost-effectiveness and could perhaps be a scenario for examining whether they are close enough to merit an OPUC exception to cost-effectiveness.

Scott Inman: Non-energy benefits need to be considered in the equation. Multifamily owners and managers are motivated by non-energy benefits because the tenants, not the owners, reap the energy benefits.
Kate: In our analysis, we are looking at non-energy benefits.
Scott Inman: I'm concerned you're not looking enough at the non-energy benefits.
Peter: We will provide our current analysis. We need to work within standard framework and protocols to determine a solution. UM 551 lists eight exceptions, and we need to work within the boundaries of those exceptions.

Alan: Is this a Total Resource Cost Test issue?
Elaine: Yes.

Alan: I share Scott's feelings. We should be paying incentives on the increment of the energy savings, not the total cost of new windows. Energy savings don't motivate people to put in new windows. There must be another motivation.
Elaine: We've heard that Energy Trust is putting a case together. From UM 1622, we now have a process in place to review potential cost-effectiveness exceptions for minor measures. We need to determine if these fall into the category of minor measures and then address the case. This is the framework we have and we are working within it.

Don Jones, Jr.: Non-energy benefits are difficult to quantify. It might be useful for trade allies active in the market to propose a way to quantify them. As a Regional Technical Forum member, we also struggle with non-energy benefits.

Don MacOdrum: The measures that survived through UM 1622 had a minimum of 0.5 on the Total Resource Cost Test, TRC. I would expect a similar target will be determined for multifamily windows.

Kim: Our intent today was to keep you informed about the process. We will have a more substantive conversation at our next meeting.

Jeremy Anderson, WISE: In past Conservation Advisory Council presentations, the TRC numbers included zero non-energy benefits?
Kate: Correct.
Jeremy: Do quantifiable non-energy benefits get baked into TRC and there they do not require an exception?
Kate: Correct.

Mary Mann, Goose Hollow Windows: The Energy Trust website features a large multifamily project with insulation and windows, and bill savings are stated to be only $3 a month. That's too low to be possible. I believe this information is wrong.
Peter: We will take a look at the project and follow up with you.

Holly Meyer: I want to make sure there is enough time for us to update marketing materials with mid-year changes. June could be an awkward time for this. Also, if you can quantify non-energy benefits, it's reasonable to bake those benefits into the equation regardless of whether 0.5 is achieved without non-energy benefits.
Peter: To clarify, all quantified non-energy benefits are included in the equation.

5. New Buildings market solutions update

Jessica Iplikci, New Buildings program manager, and Susan Jowaiszas, commercial and industrial senior marketing manager, presented an update on the small commercial market solutions offering.

Jessica: Small commercial buildings represent a large share of new construction. There is a lot of new construction activity right now. When the economy began to recover, we saw a lot of small commercial building construction, and now we are seeing more large commercial new construction that undergo extensive design starting to be built and come online. Small commercial buildings are defined as 100,000 square feet or less. The majority of our small commercial buildings are between 5,000 and 20,000 square feet. These include major renovations and new construction projects. These buildings can be partially or entirely owner occupied, and our program interacts closely with these business owners.

> In 2010, New Buildings kicked off a small commercial efficiency pilot and learned how small customers make energy decisions, including how to best reach them and what tools they need. Small commercial buildings are too small for energy modeling to be cost-effective, so these customers typically install prescriptive measures instead of custom measures. We want to move these customers from installing one or two prescriptive measures to installing many prescriptive measures. These customers also like to move quickly, and we need to move at their pace. To address these customers, we created the market solutions offering, featuring packages of prescriptive incentives for small business customer sites and customer-facing workbooks.
>
> Market solutions projects represent *13* percent of all small commercial projects, but 24 percent of electric savings and 30 percent of gas savings for all small commercial projects. *[Post-meeting editorial correction from the incorrect 5 percent originally presented.]*
>
> To date, 160 projects with more than 8 million square feet have enrolled in market solutions. To date, we have closed 117 market solutions projects. Of Good, Better and Best options, 64 percent of owners are pursuing Better or Best packages. Most of the projects are in the Portland Metro area, aligning with construction activity in the state. Market solutions projects have increased since 2013, growing from 17 in 2013 to 52 in 2015. The majority of gas savings are from restaurant projects.

Alan: Why are there so many projects in Portland?
Jessica: In Portland, we have seen an extremely strong construction market with population growth. In particular, multifamily construction that also becomes an anchor for retail and other market segments that follow and build around population centers.

Susan presented the recent “Hey Building” advertising campaign featuring completed new construction projects. Advertising will drive potential customers to a new microsite to learn more and take action.

Jessica: Moving forward, we will update market solutions packages to accommodate changes in code and avoided costs, launch a new offering for large multifamily buildings, add new measures and revise the office and retail packages to include HVAC as an elective instead of a core requirement.

Don Jones, Jr.: Is server room optimization part of any of the market solutions packages?
Jessica: Yes, server rooms are part of our package for offices.

Susan: Workbooks are easy to use and have worked as a great outreach tool.

Don Jones, Jr.: Who is the New Buildings delivery contractor?
Jessica: CLEAResult.

6. Energy Trust pilots

Mike Bailey, engineering manager, presented an overview of current Energy Trust pilot projects.

Mike: Pilots help Energy Trust develop new measures and program approaches. They help us find the best way to deliver energy savings or generation and help us quantify costs, energy savings and energy generation. Pilots are experiments that help us decide what efforts are feasible, necessary and affordable. Energy Trust's process for managing pilots requires formal approval by Energy Trust's Management Team.

> Between August 2014 and July 2015, Energy Trust conducted 21 pilots at varying stages, spanning all sectors. Five of those 21 pilots completed in that period. Pilots comprise approximately 2 percent of Energy Trust's total funding.
>
> Cost-effective measures resulting from pilots include smart thermostats, heat pump water heaters with NEEA, SEM for commercial and small industrial customers and multifamily smart power strips. Some pilots are successful even when they do not result in a new measure because they help Energy Trust determine not to pursue a large-scale investment in a potential measure that does not work as expected.

Brent Barclay: How do you overlap with NEEA's work? Do you take these learnings to the Regional Technical Forum?
Mike: Fred and I meet regularly with NEEA's emerging technology team to explore opportunities. NEEA has a slightly different scope for market transformation. For example, NEEA explores influencing codes and standards changes and we don't. We communicate with NEEA to share information, such as what other organizations are exploring similar pilots. We also work with the Regional Technical Forum to gain technical feedback on pilot research plans, and to avoid duplicating efforts of other utilities. For example, Avista is exploring commercial power strips and Energy Trust is exploring residential power strips.

Kim: Are we coordinating enough with Bonneville Power Administration?
Brent: More coordination and sharing of results benefits all of us.
Mike: We're coordinating, but there is more we can do.
Peter: Sometimes pilots look duplicative, but organizations will explore different applications of a certain approach or technology.

7. Planning for the 2016 Conservation Advisory Council

Kim shared Conservation Advisory Council operations principles and possible agenda items for 2016, and requested feedback.

Don MacOdrum: The operating principles look good. I'm wondering how the item about providing on-boarding for new council members has gone.
Brent: We reviewed these relatively recently, so I think they're okay. What do new Conservation Advisory Council members think?

Julia Harper: I like the succinct presentations, but I would like more context and background to review prior to presentations.

Kim: That's great feedback, we'll think about it. I also encourage all of you to ask about context during presentations.

Tyler: I appreciated the new member orientation. I'm learning more through attending meetings.

Holly: I'm not new, but it would be helpful to start presentations with a big picture introduction. It would be good to start presentations by explaining why each topic is important right now.

Council members approved the 2016 operating principles. Kim will distribute the final document at the next meeting.

Alan: The Renewable Energy Advisory Council and Conservation Advisory Council are different, and it could be helpful for Kim and Betsy Kauffman to share best practices.

Holly: Alan, thank you for attending advisory council meetings. I have appreciated your presence and thoughts.

Don MacOdrum: Do we need to review the operating principles annually? I think we could review them less frequently and remove the year from the document.
Kim: Adding the date was a request from Holly.
Holly: It's fine to remove the year from the document as long as we remember to review it regularly.

Don Jones, Jr.: How is Conservation Advisory Council working for staff?
Kim: I'm not sure we've had this internal conversation outside of the Sector Leads and Peter, but we should. I personally would like to see more staff engagement in Conservation Advisory Council meetings. That was one of the reasons we gathered this list of potential 2016 Conservation Advisory Council topics, as a way to get staff thinking creatively about what sorts of topics they'd like to bring to you.
Peter: Staff appreciate the Conservation Advisory Council. I think there are opportunities for improvement. What are the best ways to provide information to and engage Conservation Advisory Council members?

Don Jones, Jr.: Are Conservation Advisory Council meetings the best way to communicate potentially controversial information to the public? Is there a parallel way to be transparent and engage the community?
Alan: You don't want to bring fully baked topics to Conservation Advisory Council, but you don't want to just start baking them in this meeting. What is the best moment to bring controversial topics to Conservation Advisory Council?
Kim: In 2015, we effectively engaged the trade ally community through our trade ally forums, especially with residential changes. We can learn from those efforts on the commercial and multifamily side.
Peter: Conservation Advisory Council is the best place to introduce these issues. It's good to bring topics to Conservation Advisory Council early and then again later when ideas are more baked.

Alan: I think we have useful, productive discussions.

Kim: In my analysis, Conservation Advisory Council only spent about 10 percent of meetings discussing controversial topics.

Andria Jacob: I appreciate presentations from customers to understand how end users work with the programs.

Holly: Are staff getting what you need out of the Conservation Advisory Council?
Kim: Yes. We also struggle with determining what topics to bring to the council and when is the right timing. That's one of the reasons I'm asking for your input.

Holly: I recommend being clear about whether or not you're looking for feedback on topics presented. If you're not looking for feedback, is there really value in sharing the information with the council?
Kim: It is very valuable for us to gauge your reaction and comfort level with information. Also, when a topic is labelled in the agenda as discussion, we are seeking your advice.

Holly: I recommend starting presentations with strategic questions to guide our thinking and get feedback.

Brent: I recommend coaching staff before they present. Coach them to ask specific questions and request specific feedback.

Kim: What topics do you want to hear about in 2016? Do you want more information about the renewable energy sector?
Andria: Yes. High-level information on renewable energy would be very helpful. For example, it was useful to learn that this was the highest ever year for solar system installations.

Holly: What about bigger picture information, like regional policy or NEEA? Bigger picture policy context would be helpful.
Andria: I would like information about the Environmental Protection Agency Clean Power Plan and how it intersects with Energy Trust.

Don Jones, Jr.: Is policy already being addressed at the board level? What is our core mission as Conservation Advisory Council? We should focus on issues within that mission before we expand to topics like renewable energy.

Don MacOdrum: I would like more information about the role Energy Trust plays in the broader energy sector and Energy Trust's relationship to other players. That information is critical to empower us to provide valuable input.

Kim: Legislative updates are featured at Renewable Energy Advisory Council. Should we include them here?
Tyler: I think that could be a good idea when there is relevant legislation.
Holly: This topic falls into the policy context topic.
Peter: Currently, the Regional Portfolio Standard expansion bill could impact us. Also a healthy climate bill.

Kim: In the last three years, the only controversial topics have been about measure changes, and in particular on residential measure changes. Overall, our conversations have been productive and useful. But if you have feedback on how to improve, please email it to me.

Don MacOdrum: Will we have a follow-up presentation on multifamily windows incentive changes?
Kim: Yes.

Don MacOdrum: For measure changes topics, the last slide of each presentation could include information about a future Conservation Advisory Council engagement plan.

Julia: On the list of potential topics for 2016, what is the Avista and Energy Trust topic?
Peter: There's a rate case with Avista regarding decoupling. When similar conversations have happened with NW Natural and Cascade Natural Gas, they ended up participating with Energy Trust. We were asked if we could provide programs in Avista territory in 2016.
Don Jones, Jr.: That would give you gas coverage in Southern Oregon, concurrent with our territory.

Julia: Regarding the AirGenerate topic, NEEA saw a lot of equipment failures in fall 2015. As of the end of January 2016, we have burned through $160,000 of the available $200,000 for remediation. If the rate of failure increases, we will run out of funds before June. While a lot of these are in Energy Trust territory, failures appear to be proportional to installations. We will continue analysis. You may want to move this topic up earlier in the year.
Kim: To reiterate what Peter said earlier, thank you for NEEA's savings contribution this year.

Tyler: Do you ever present on the Integrated Resource Planning process?
Kim: It's on our list for 2016.

Holly: A few years ago, we had a cost-effectiveness offsite workshop. That was beneficial and I would like to do that with other topics if needed.
Kim: Please suggest topics for offsite workshops. What do you need to know more about to be a better advisor?

Peter: It would be good for us to know what about the IRP you are most interested in.It is a large topic. Also, consider what you want to hear from each other, like a presentation from Andria about City of Portland benchmarking.

Elaine: Another agenda item could be Energy Trust's role in demand response and demand management.

8. Public comment
Faye Rachford: I recently moved here with an energy-efficiency background. As a newcomer, I'm glad I came. It gave me a greater sense of Energy Trust's purpose and makes it clear that other industry professionals are contributing input to the organization.

9. Meeting adjournment
The next scheduled meeting of the Conservation Advisory Council will be on March 16, 2016, from 1:30 p.m. – 4:30 p.m.

INCENTIVES FOR MARIJUANA CULTIVATION

GREENHOUSE REBATES AVAILABLE

- Infrared, IR, polyethylene greenhouse covers
- Greenhouse controllers
- Condensing unit heaters
- Under-bench heating equipment
- Thermal curtains

Incentives are also available for irrigation systems and other energy efficiency improvements. Talk with your equipment vendor for rebate forms and complete information.

**Incentives are subject to availability and may change.*

Cultivation of medical and recreational marijuana can be extremely energy intensive. Energy Trust of Oregon offers licensed growers technical services and cash incentives for the installation of energy-efficient equipment at new and existing grow facilities.

Custom energy solutions

Energy Trust can work with marijuana producers to identify and implement custom improvements that can reduce energy costs over conventional equipment.

Energy Trust technical services and cash incentives are available for:

- High-efficiency lighting and lighting controls, including LEDs. Energy Trust lighting specialists can work with you or your lighting vendor to specify qualified equipment.
- Technical studies to identify energy-efficiency opportunities for HVAC, building shell and other improvements, for qualified projects. Energy Trust can pay up to 100 percent of the cost of a study.

Cash incentives, which are based on estimated annual energy savings, can cover up to 50 percent of your investment cost. Incentives can be provided directly to the equipment vendor or contractor, reducing upfront project cost. All custom projects must be pre-approved by Energy Trust to be eligible for incentive payments.

Eligibility requirements

- Your business must be licensed by the State of Oregon and be on the active business registry
- Energy-efficiency measures must be installed in a permanent structure. Trailers or moveable structures are not eligible for incentives
- The project site must be located in Oregon and served by Portland General Electric, Pacific Power, NW Natural or Cascade Natural Gas, on a qualifying rate schedule
- Energy Trust must conduct pre- and post- verification for the installation
- Additional eligibility requirements may apply and could vary depending on your project

Get more from your energy.
For a complete list of rebates and incentives, visit **www.energytrust.org/ag** or call **1.866.202.0576**.

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1/16

EnergyTrust of Oregon

Existing Multifamily Windows Incentives - Analysis & Recommendations

To be presented at the Conservation Advisory Council meeting April 20, 2016

Background

In 2015, Energy Trust conducted a review of all electric measures, incorporating new avoided costs and reviewing non-energy benefits assumptions. As a result of this review, it was determined that windows in electrically heated existing multifamily buildings were no longer cost-effective.

This topic was introduced to the Conservation Advisory Council in November 2015, and subsequently Energy Trust has conducted stakeholder discussions, undertaken updated analysis of electric multifamily windows measures incorporating data from the Regional Technical Forum as well as other factors such as tax credit impacts and non-quantified non-energy benefits, and engaged with the Oregon Public Utility Commission on potential exceptions.

On April 20, Energy Trust will present this topic to the Conservation Advisory Council for discussion the key outcomes of these activities, analysis, and recommendations for moving forward.

OPUC exception requests

In March, Energy Trust submitted an exception request to the OPUC for a subset of windows measures in electrically-heated existing multifamily buildings. The OPUC granted this exception, which included the following:

- Recommendation to align small multifamily (2-4 units) with single family incentives, on the basis that the energy usage profile of these structures is more similar to single family homes than large multifamily properties.
- Request to allow continued incentives for single-pane window replacement in electrically-heated existing multifamily properties with 5 or more dwelling units, on the basis that this subset of windows measures had a TRC of 0.5 under the current Energy Trust savings estimates.
- Granted through the end of 2017 to allow time for the RTF to complete its analysis.

After subsequent discussion with stakeholders, it was requested that Energy Trust conduct further analysis incorporating recently updated RTF data to support an expanded exception which would also include storm windows and double-pane window replacements for electrically-heated buildings.

This updated savings analysis which incorporates the updated RTF data is summarized below. As a result of the updated information incorporated into the savings estimates, it was found that for electrically-heated multifamily buildings with 5 or more dwelling units, both storm window and double pane replacements had a TRC of 0.5 or above. As a result, Energy Trust has submitted an exception request to the OPUC to allow continued incentives for these as well. The discussion on April 20th will help inform the OPUC's decision on this request.

This expanded exception request includes the following additions to the prior granted exception:

- Request to allow continued incentives for storm window and double-pane replacements in electrically-heated existing multifamily properties with 5 or more dwelling units.
- Recommendation to align townhomes with single family incentives as well, on the basis that the energy usage profile of these structures is also more similar to single family homes than stacked multifamily properties.
- Requested through the end of 2017 to allow time for the RTF to complete their analysis.

Savings analysis

Recent information and analysis from the RTF provided a preliminary estimate of savings which was not calibrated to energy usage data, and a small set of building energy use data from the Residential Building Stock Assessment. Energy Trust modified these savings estimates using the data set the RTF developed, and then averaged the results with the previously referenced Energy Trust savings estimates. We then also employed recently updated cost estimates. With these updated assumptions, all existing multifamily electric windows measures now have a Total Cost Test benefit/cost ratio of 0.5 or greater. This served as the basis for requesting the exception for these measures. The updated savings and cost-effectiveness is as follows:

Existing Multifamily windows, 5+ dwelling units, electric heat			
Measure	**Savings (kWh)**	**Incremental Costs ($)**	**TRC BCR**
single pane (aluminum frame) to U < 0.30	8.5	$17.30	0.9
single pane (wood frame) to U < 0.30	7.9	$17.30	0.9
single pane (aluminum frame) and storm window to U < 0.30	8.1	$17.30	0.9
double pane (aluminum frame) to U < 0.30	4.6	$17.30	0.5

Energy Trust also looked at factors such as tax credit impacts on cost-effectiveness and non-quantified non-energy benefits scenarios, which will also be summarized at the CAC meeting.

Recommendations

Energy Trust is recommending the following incentive structure effective June 1:

Proposed Existing Multifamily windows incentives; effective June 1	
Duplex, triplex, fourplex	Align with single-family incentives *Electric or gas heat:* - U-Value 0.28 - 0.30 - $1.75 per square foot - U-Value of 0.27 or less - $4.00 per square foot
Townhomes*	

Stacked with 5+ dwelling units	Maintain current incentive levels *Electric heat:* - Single pane replacement, U-value 0.30 or lower - $3.00 per square foot - Double-pane replacement, U-value of 0.30 or lower - $2.00 per square foot*****

***** *Pending OPUC approval*

Gas Smart Thermostat Pilot Evaluation

APEX ANALYTICS, LLC

EnergyTrust of Oregon

Residential Pilot Background

2013-2014:

- Pilot to test Nest t-stat as heat pump control
- Nearly 200 homes – showed clear success
- High satisfaction, robust electric savings

2014-2015:

- Smart t-stat pilot in gas heated homes (NWN territory)
- Potential for a new, cost-effective gas measure
- Test the self-install model for smart t-stats
- Nest and Honeywell Lyric selected for pilot

Thermostat Features

Thermostat Feature	Nest	Lyric
Occupancy Detection	Auto-Away	Geofencing
Early Warm-up	Early On	Adaptive Recovery
Furnace Filter Reminder	Filter Reminder	Smart Cues
Automated Programming	Auto Schedule	No
Energy Usage Tracking	Energy History	No
Energy Savings notification	Nest Leaf	No
Pre-Programmed Settings	No	Shortcuts
Alerts: Notification for home and heating system issues	Safety Temperatures	Smart Cues
Override settings for empty house	Away Mode	Away button
Considers both indoor and outdoor temperature and humidity to reach set point	Nest Sense	Fine Tune

Pilot Implementation

- Recruitment via NWN email marketing
- Additional recruiting within Energy Trust
- Program offered discounted Nest or Lyric thermostats to selected gas customers for $219
- Application and purchase process was entirely online
- Participants installed thermostat, setup account
- $200 rebate to participants

Pilot Process

- Randomly selected 22,000 treatment and 1,000 comparison customers
- Recruitment emails had link to sign-up/ screening survey
- Candidates had to meet eligibility criteria
- Eligible customers were randomized into Nest and Lyric groups
- Qualification emails sent with link to purchase thermostat

Evaluation Goals

- Quantify gas savings for self-installed smart t-stats in gas furnace heated homes
- Understand participant experiences, interactions and satisfaction with t-stats
- Identify differences between the two t-stats
- Determine if smart t-stats are a viable technology to achieve cost-effective gas savings

Evaluation Methods

- Apex Analytics conducted evaluation activities
- In-depth staff interviews
- Two online participant surveys:
  - Survey 1 mid heating season – 83% response
  - Survey 2 post heating season – 90% response
- Billing analysis to determine gas savings
  - Analyzed monthly gas data, controlled for weather
  - Compared pre-to-post change between treatment and comparison homes

Findings

Installation Rates

Participation Phase	Nest	Lyric	Total
Number of thermostats purchased	220	195	415
Returned/defective/shipping problem	8	24	32
Total thermostats installed	**212**	**171**	**383**
Percent of thermostats installed	**96%**	**88%**	**92%**

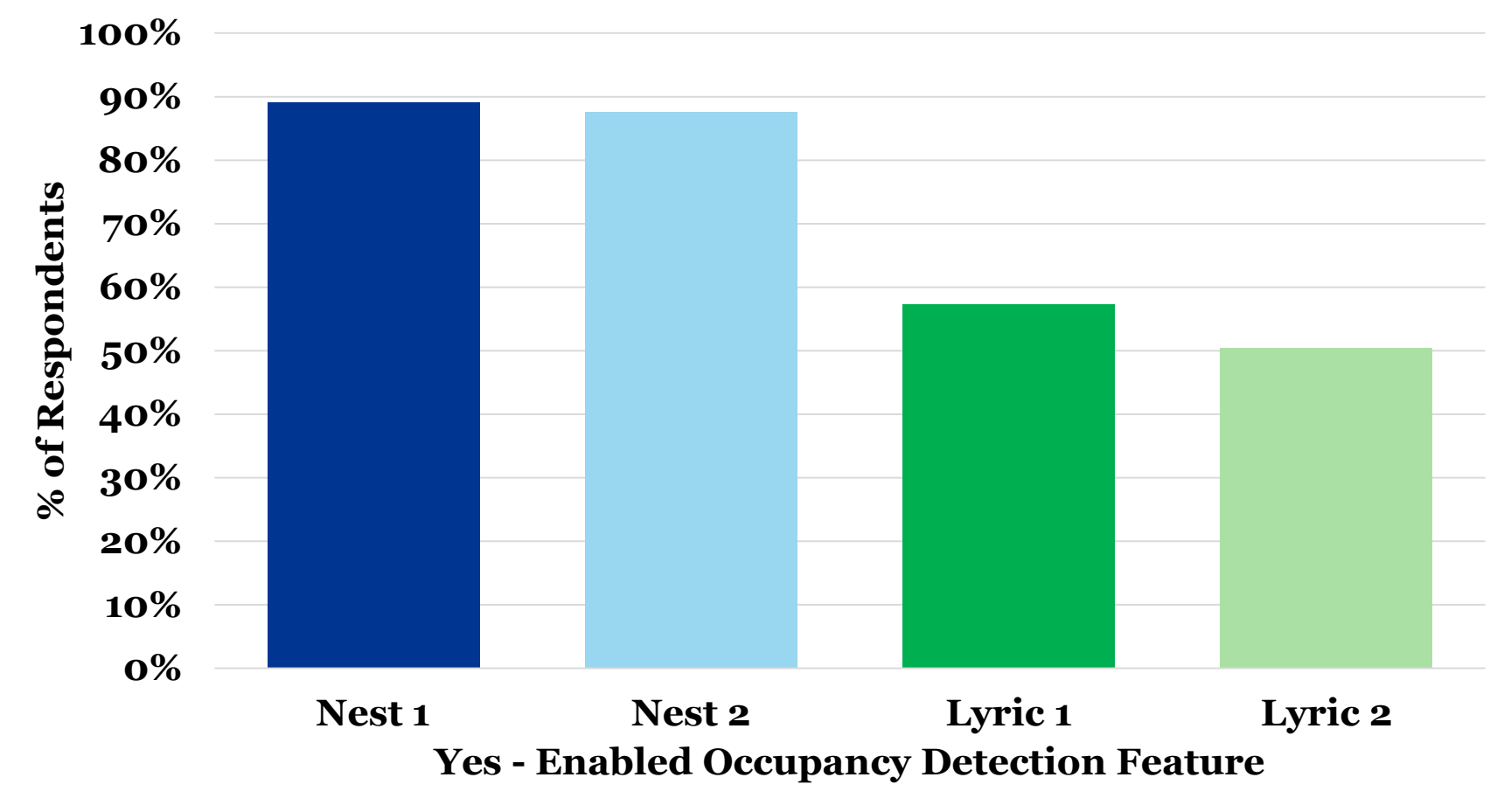
Participant Characteristics

- Only minor differences between Nest and Lyric homes
- 75% located in Portland metro area
- Age distribution matched general population well
- Higher than average income and education levels
- 90% replaced a programmable t-stat

Installation Experiences

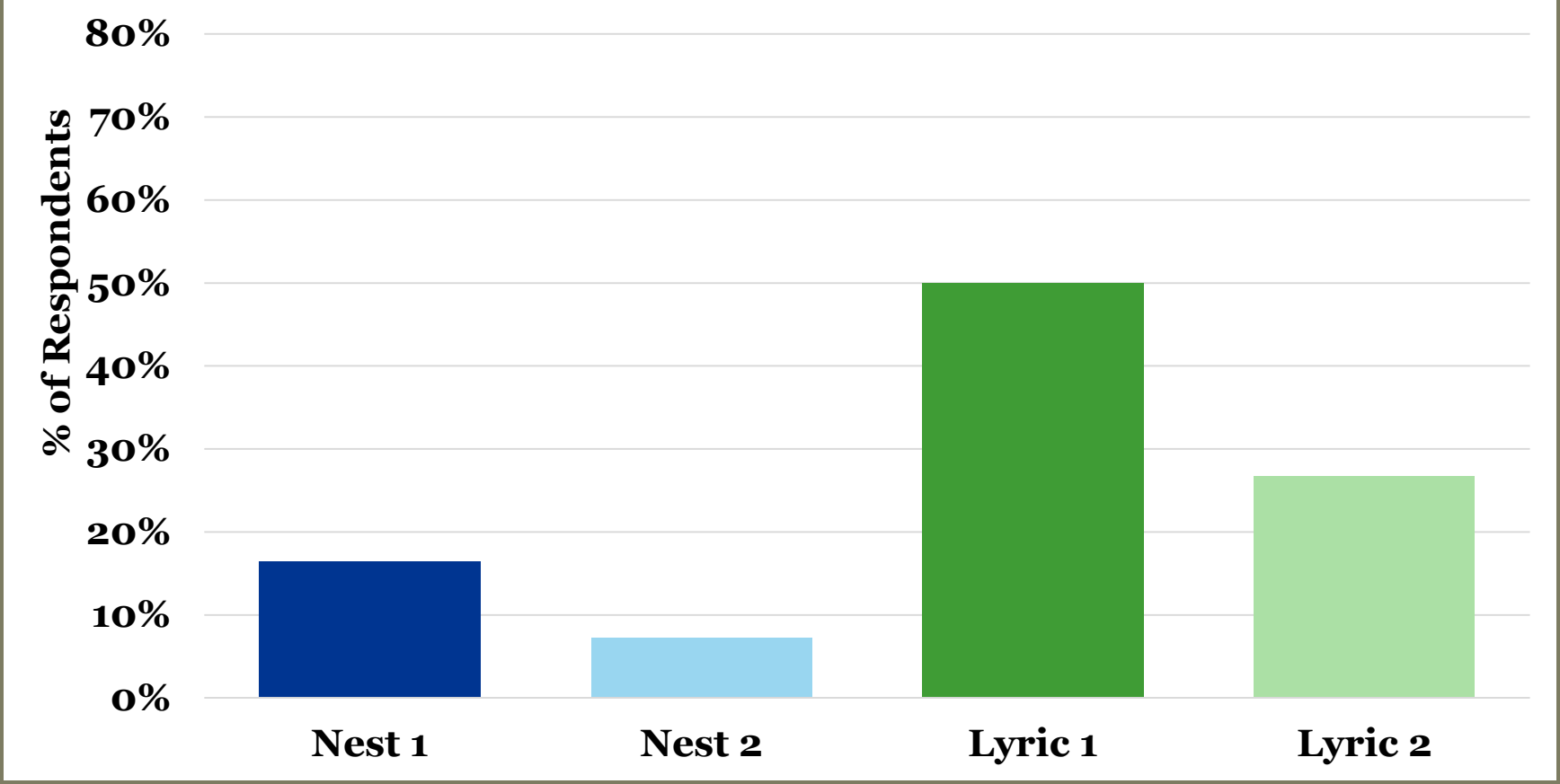
- Most installed t-stat in one hour or less without additional support
- Installation and setup were significantly easier for Nest users and was 22 minutes faster
- 37% of Lyric users reported install problems, compared to 10% for Nest

Occupancy Detection



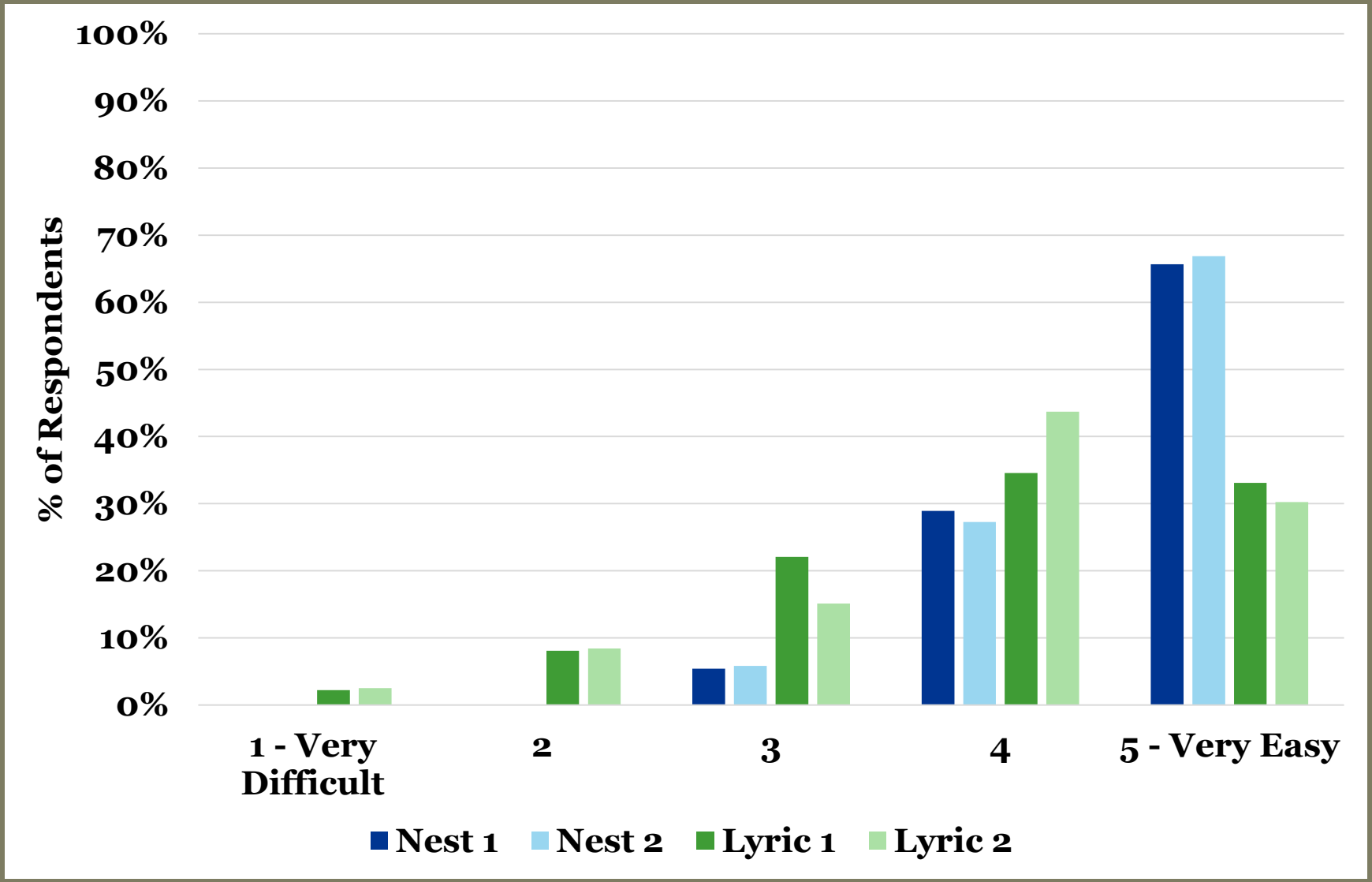
- Many Lyric users did not setup or use geo-fencing
- Nest users disabled auto away in some cases

Post-Installation Problems



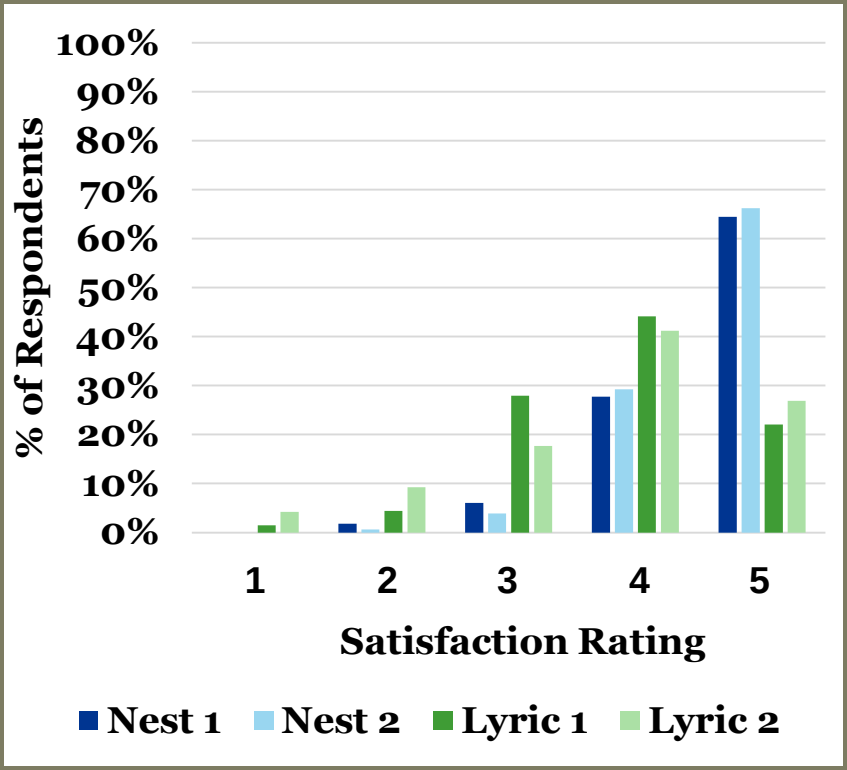
- Nest top issues were: operating thermostat, Wi-Fi connection, and home too cold
- Lyric top issues were: occupancy detection, schedule adjustments, operating thermostat

Ease of Use

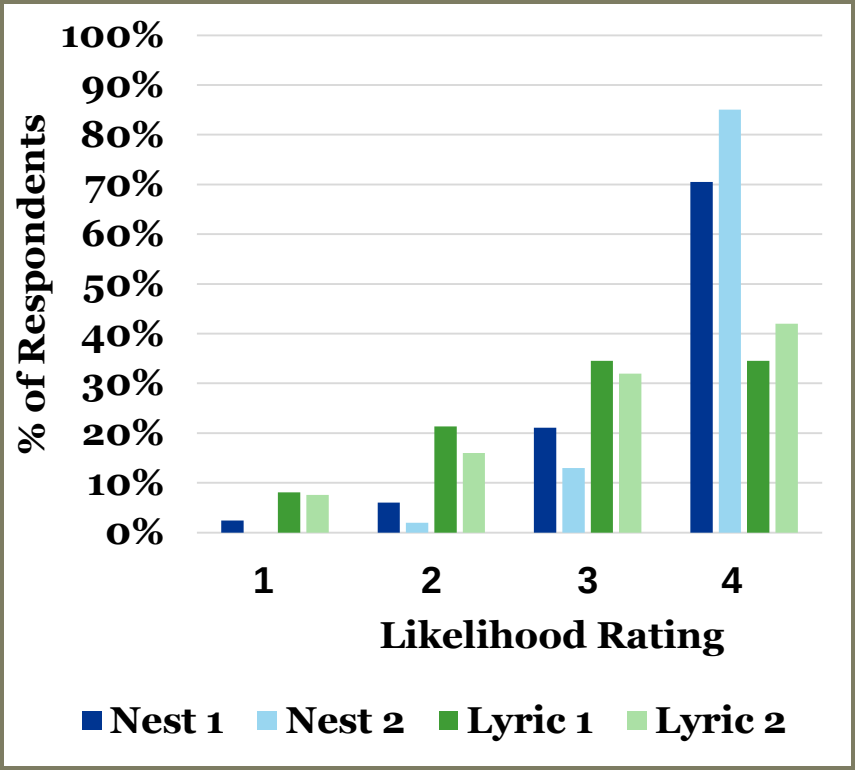

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% of Respondents
1 - Very Difficult
2
3
4
5 - Very Easy
Nest 1
Nest 2
Lyric 1
Lyric 2

Satisfaction

Satisfaction with T-stat



Likelihood of Recommending

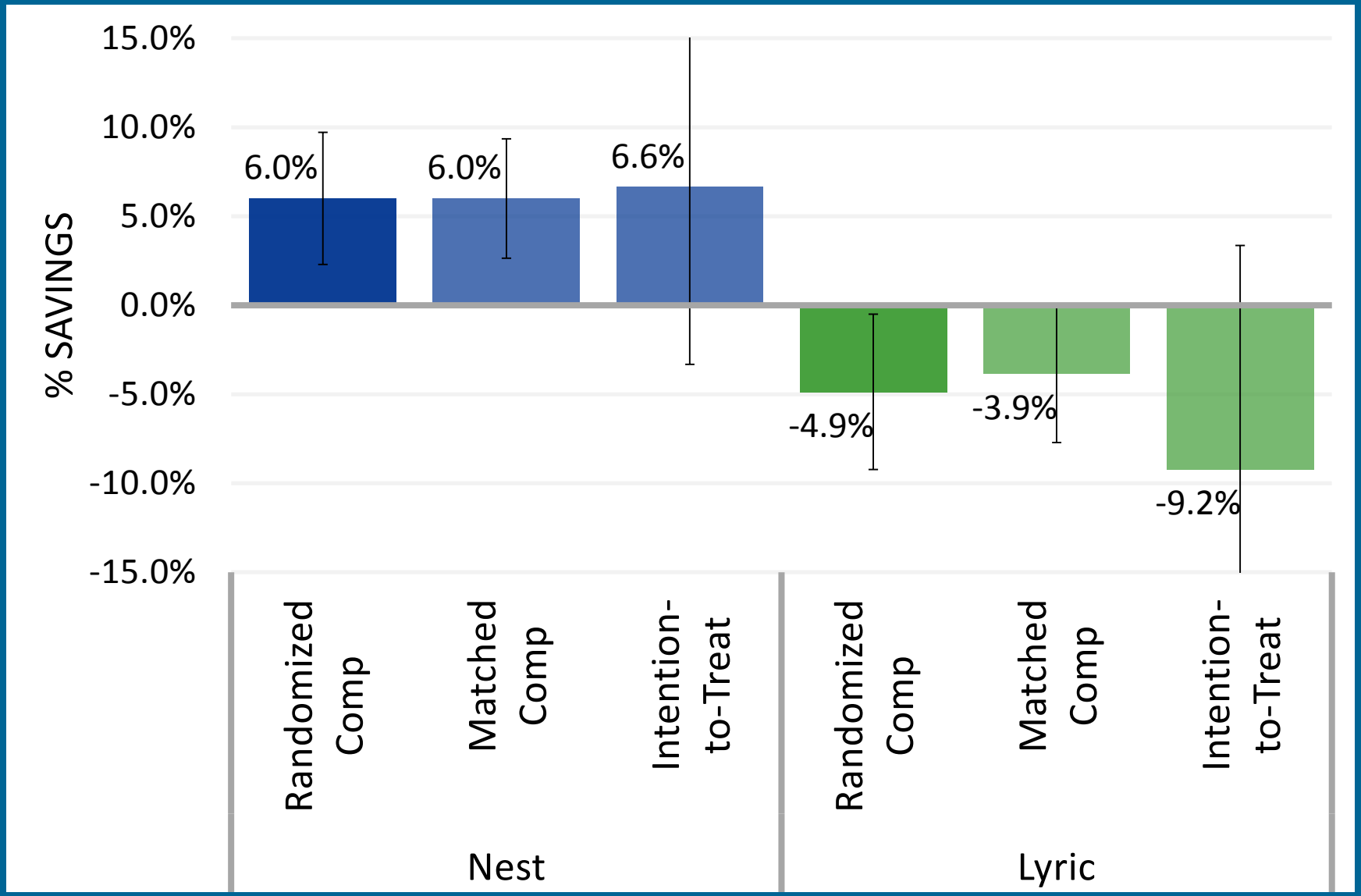


- 34% of Lyric users would have returned t-stat, compared to 10% for Nest

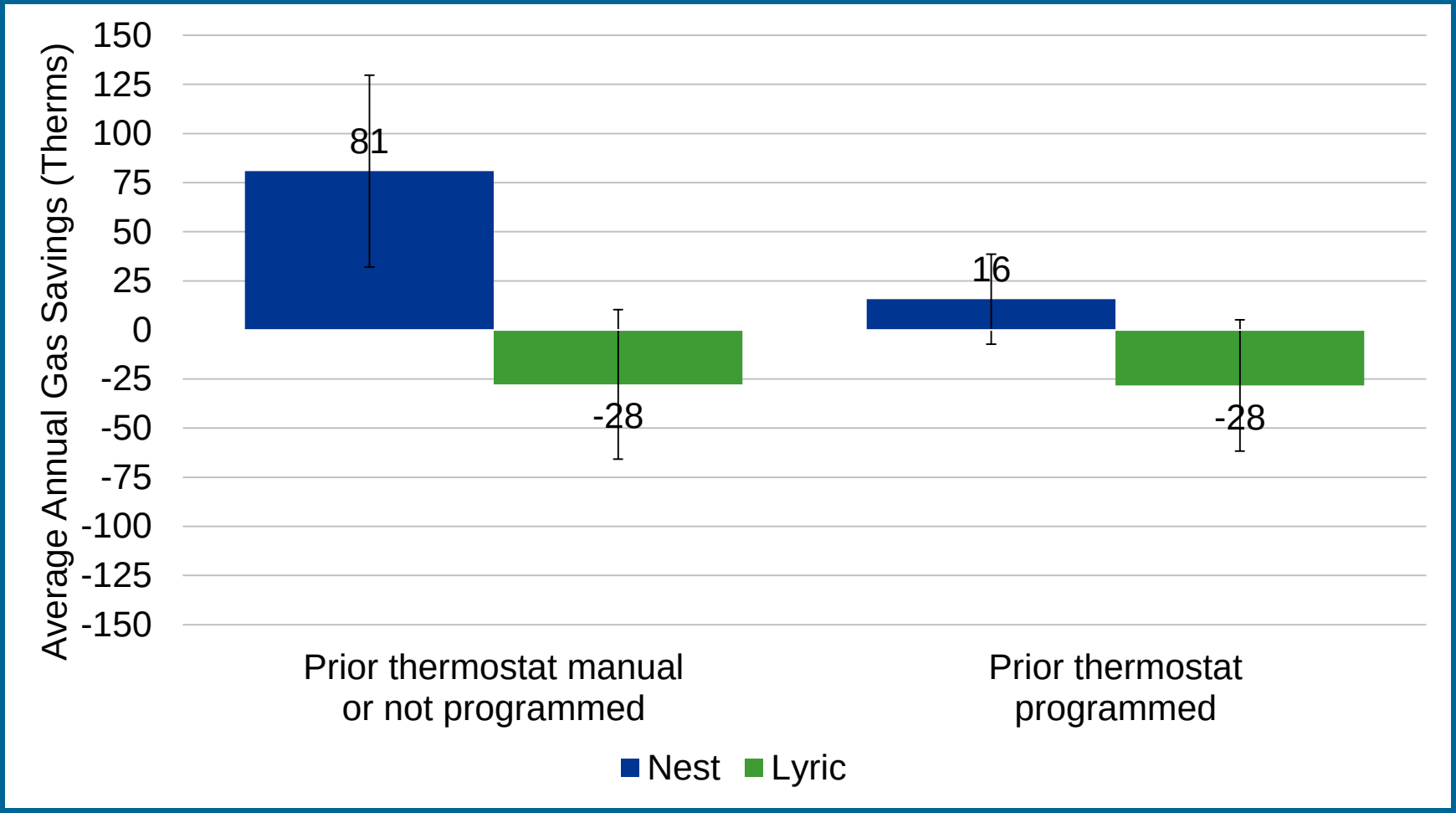
Other Perceptions

- Vast majority of participants equally or more comfortable than before t-stat installed
- Saving energy rated as most important single feature of both t-stats
- 52% of Nest users believed retail price was justified, only 30% of Lyric users agreed
  - Most held these beliefs even if no savings

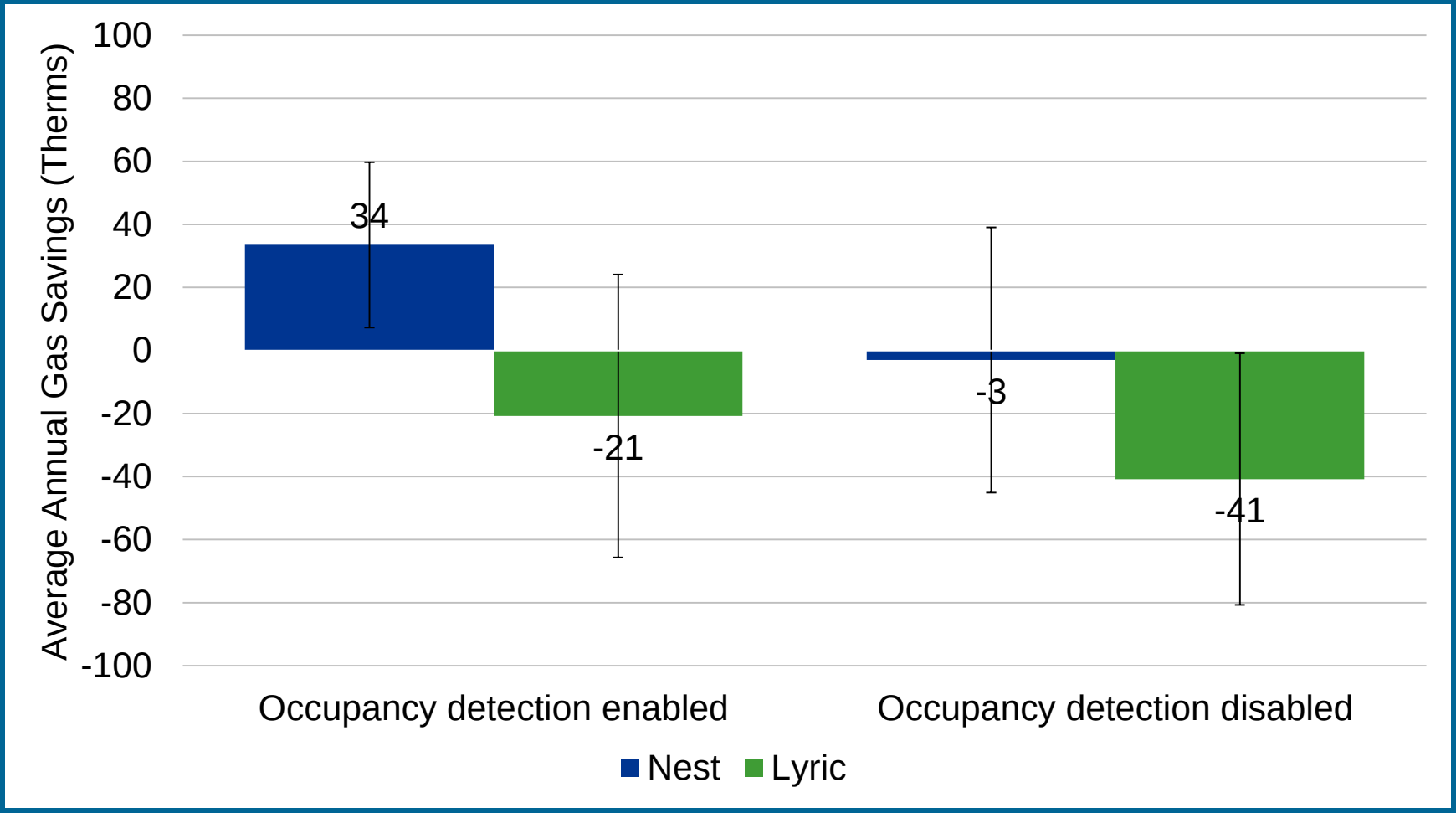
Energy Savings Results



Savings by Prior Thermostat Type



Savings by Occupancy Detection Status



Conclusions

Evaluation Conclusions

- Nest showed significant gas savings while Lyric was associated with increased usage
- Participants overwhelmingly preferred Nest
- Nest performed better across all satisfaction and user experience metrics
- Smart t-stats are a viable technology but need to be careful in qualifying products

Benefit Cost Ratio

Measure	Measure Life	Savings		Incremental Costs ($)	TRC Benefit/Cost Ratio
		kWh	therms		
retail web enabled thermostat, electric forced air furnace and heat pump	11	331	--	$100	2.51
retail web enabled thermostat for gas forced air furnace	11	--	32	$100	1.35

Program Integration

Current Program Offering

- Smart t-stat incentive for $50
  - Self-install, any heat source
  - Existing Homes or Products pathways
  - Nest is currently the only qualified product
  - Developing criteria and screening additional t-stats

Current Program Offering

- Heat pump advanced control incentive
  - $150 for contractor installation
  - Existing Homes incentive form
  - QPL of t-stats with back-up heat lockout capability, including several smart t-stats

Future Pilot Plan

Nest Seasonal Savings

- Nest applies algorithms to slightly modify temperatures and schedules for each season (summer and winter)
- Recruitment messages will be sent to 7,000 randomly selected Nest homes
- 7,000 Nest homes will be set aside as control group
- Heating and cooling savings will be estimated by Nest
- Energy Trust will further evaluate offering

Primary research questions

- What are the energy savings associated with Seasonal Savings?
- What is the persistence of these savings?
- How satisfied are homeowners with Seasonal Savings?

Deployment

- Co-branded Nest and Energy Trust email to create awareness for Seasonal Savings
- Seasonal Savings message will appear on device asking customers to opt-in
- A prompt will appear when customers attempt to make less-efficient adjustments
  - A "speed bump" message asks the customer to confirm they want to change the set-point
- Email communications from Energy Trust requesting participation in a survey
- Final thank you and notification that study has ended

Thank You

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EnergyTrust of Oregon

New Buildings Training and Education Initiatives

March 2016

Energy Trust of Oregon

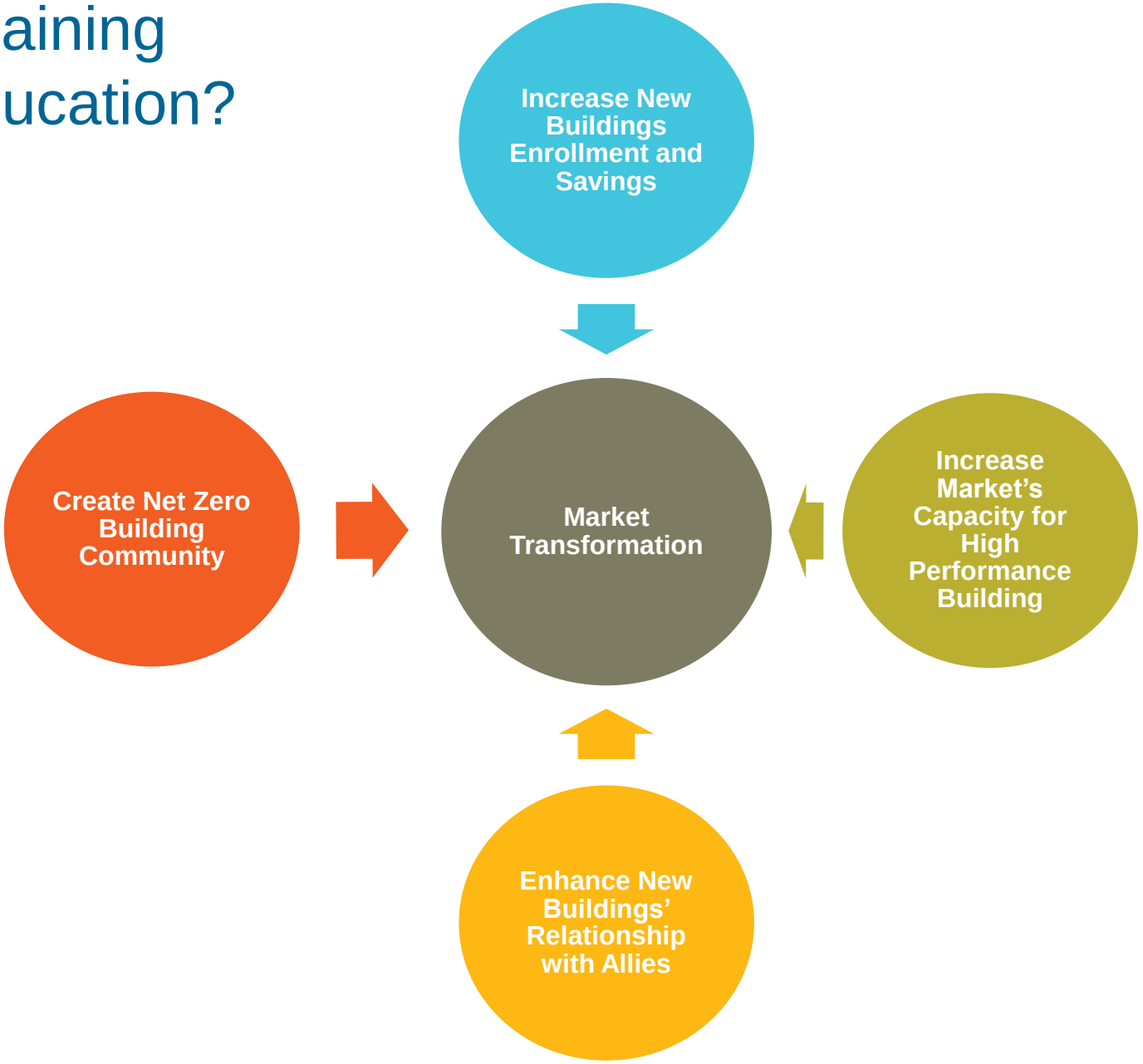
New Buildings Vision

Where are we headed?

- “From one size fits all to specialized.”
- “From individual systems to whole building.”
- “From Portland-centric to whole state.”
- “From incremental to net-zero.”
- “From inspiration to action.”

Training and Education efforts are an important tool for New Buildings and are one way we reach our energy savings goals and influence the direction of the building industry.

Why Training and Education?



Training and Education Strategy

Four-part approach for reaching our target audiences:

Training & Education Events
Allies for Efficiency
Allies for Efficiency 2.0
Building Energy Simulation Forum
Special Events

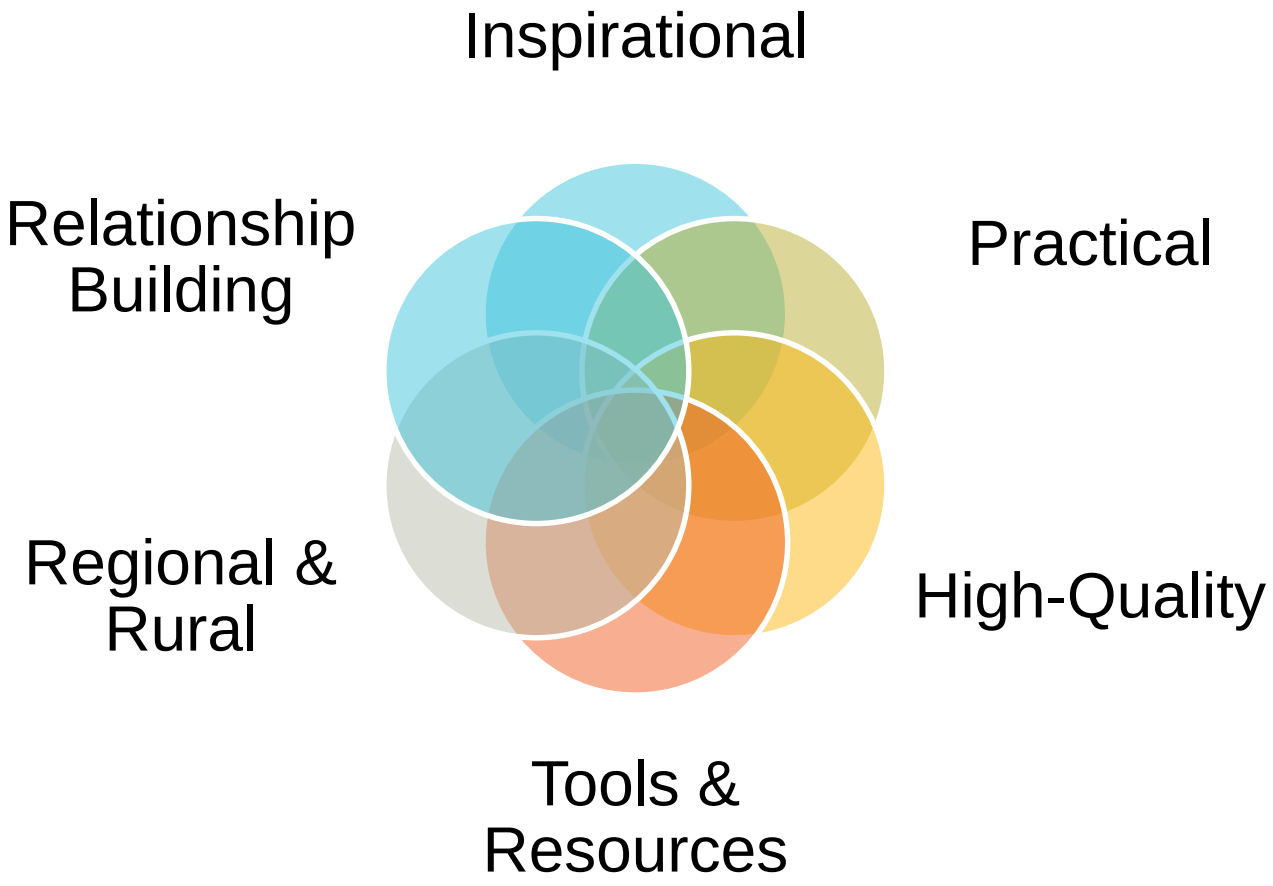
Outreach & Support
Lunch & Learns
One-on-One Meetings
Tool Trainings
On-call Staff

Marketing
Case Studies and Customer Stories
Online, Easily Distributed Resources
Materials for Outreach
Training & Education Announcements

Community Building
Net Zero Fellowship
Recognition Events
Connection to Regional Labs
Networking Events

Training and Education Strategy

Characteristics of our training and education initiatives:



Trainings and Education Implementation

Strategic Areas of Focus

- Path to Net Zero and high performance construction
- Integrated Design Process
- Advanced techniques and skills for designing high performance buildings
- The Financial Case for Net Zero

Content Creation Strategy

- Use past NB projects to find potential case studies
- Leverage industry relationships (engineers want to present to architects, architects want to present to owners/developers, etc.)

New Buildings Audience

Who are our Allies—and how to we reach them?

Trade Allies
Specialty contractors, general contractors, & equipment vendors

→ Program orientations, presentations and one-on-one meetings, Allies for Efficiency training series

Program Allies
Architects, Engineers, Owners, Developers, Brokers/Lenders

→ Allies for Efficiency training series Developer Roundtable, NZ Fellowship

Program Allies
Energy Modelers and Analysts

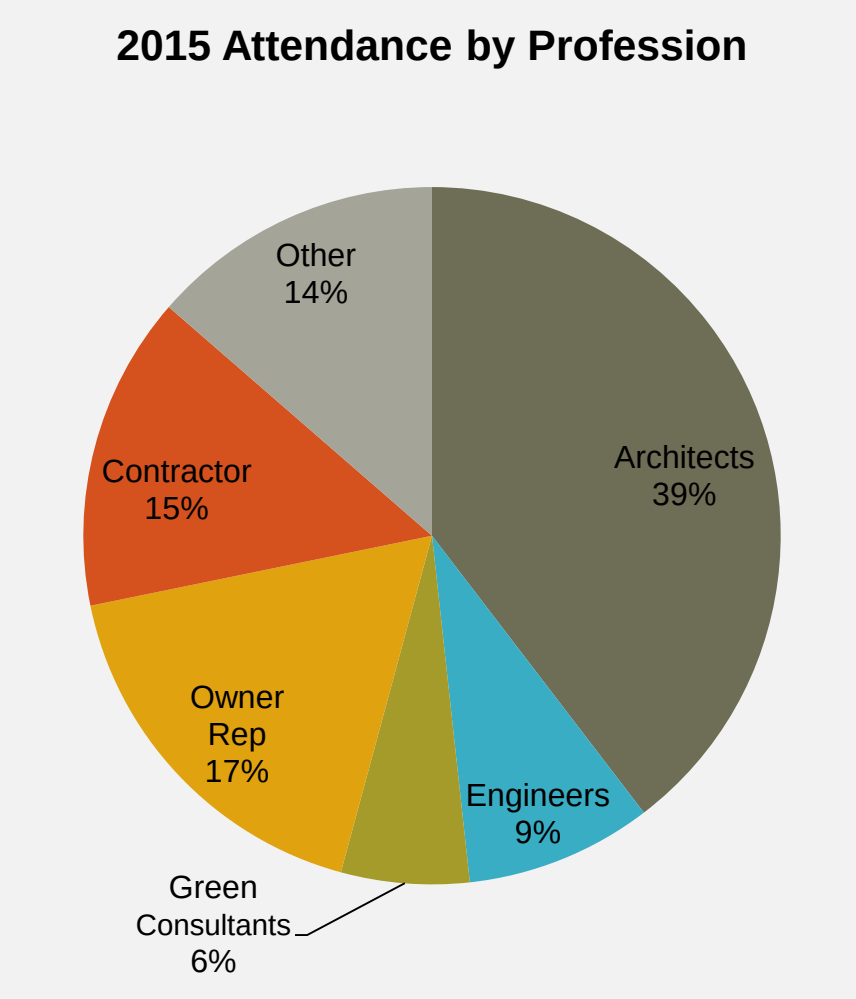
→ Building Energy Simulation Forum, Energy Modeling for New Buildings trainings, EDAPT trainings, AEE Partnership

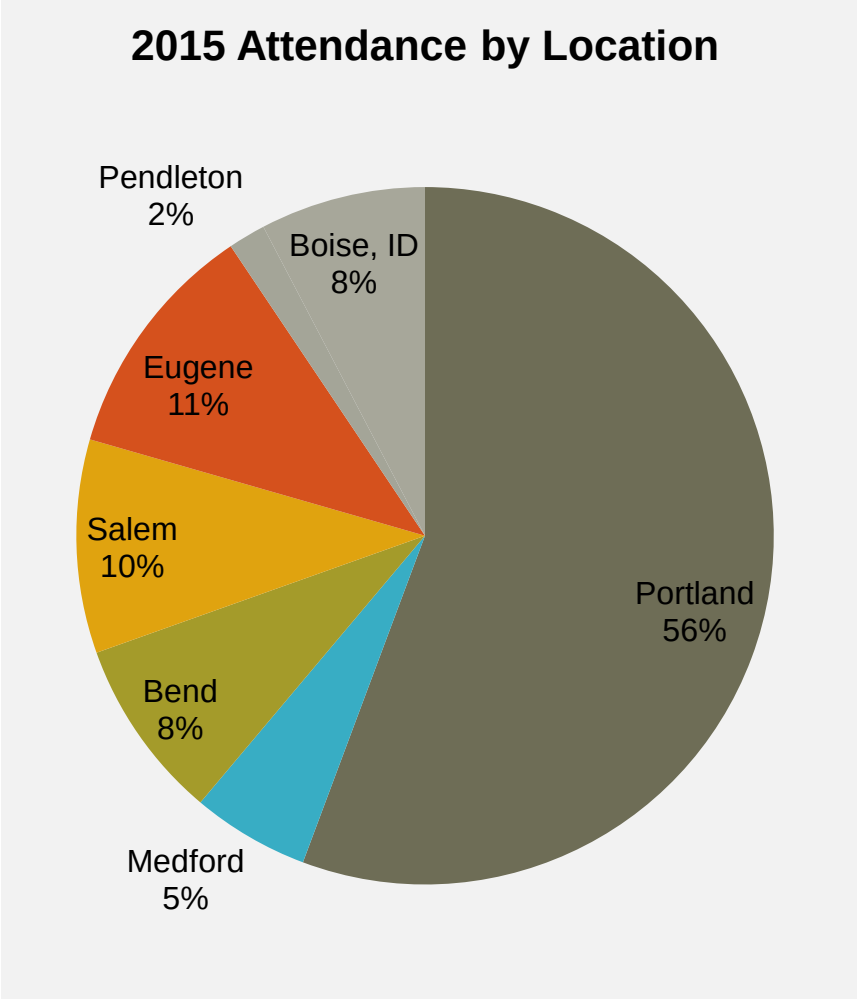
Allies for Efficiency Training Series

Allies for Efficiency

- Flagship training series; 3 planned per year
- Content is usually case studies
- Large event (100-150 attendees)
- All stakeholders encouraged to attend
- Group webinars available at 6 remote locations
- Past topics include net zero, passive design, solar ready and deep retrofits

Allies for Efficiency – A Look Back





Allies for Efficiency in 2016

March 16

Efficient and Affordable: Applying the Passive House Standard to Low-income, Multifamily Projects

Topic: Orchards at Orenco Station - “Largest multifamily Passive House building in North America”

Presenters: Walsh Construction Co., Green Hammer, PAE, REACH Community Development, Ankrom Moisan Architects

May 26

High-Performing Collaboration: The Collaborative Life Sciences Building’s Path to High-Performance Design and Construction

Topic: “Collaborative work relationship between owner and design team”

Presenters: SERA Architects, Interface Engineering, JE Dunn Construction, OHSU

Sept / Oct

Case Study on Daimler North America Project (tentative date and title)

Topic: TBD

Presenters: Glumac, Ankrom Moisan Architects, Daimler

Regional Allies for Efficiency Training

NEW in 2016

April 14

Aesthetics in a High-Performing Building—How Beauty Blends with Energy Savings
Project to Highlight: UUFCO New Home
Location: Bend, OR (Central)
Presenters: Hacker Architects, PAE, Kirby Nagelhout Construction

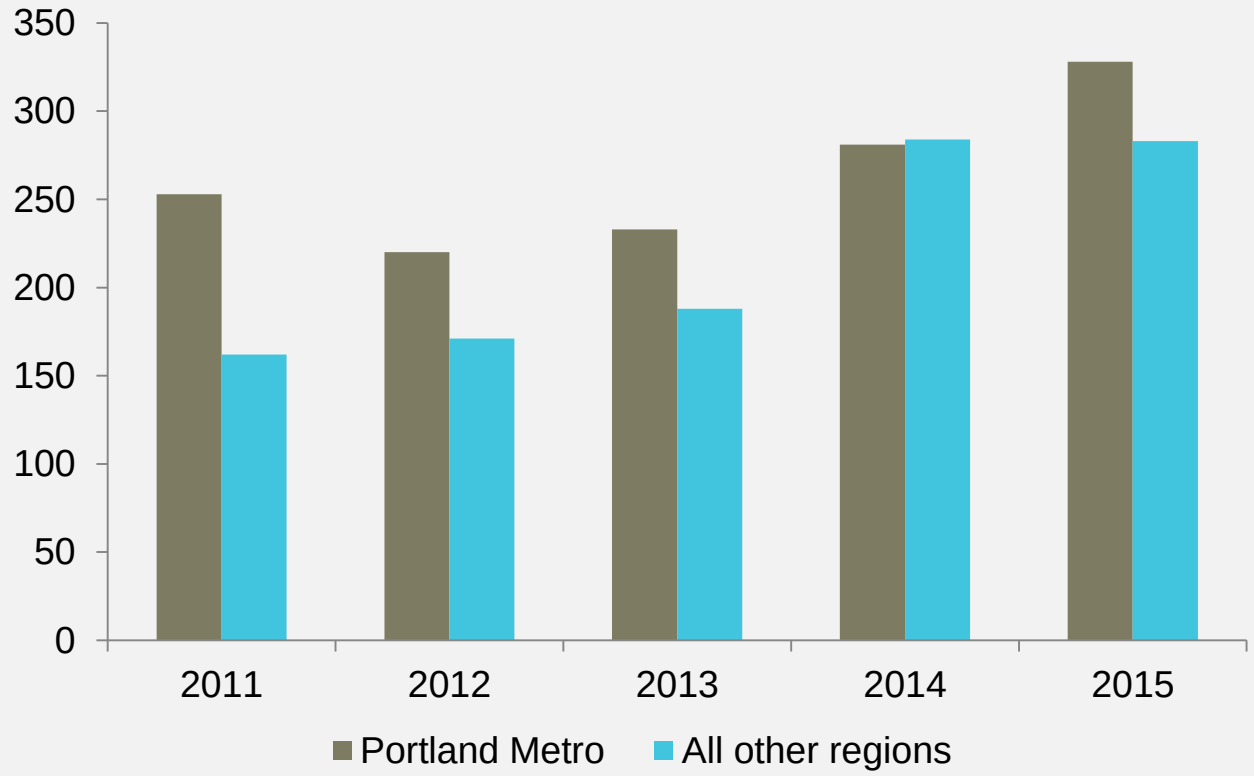
June / July

Cownhorn Winery's Path to Net Zero (title and date TBD)
Project to Highlight: Cowhorn Winery's new tasting room
Location: Jacksonville, OR (Southern)
Presenters: Green Hammer

Possible additional training TBD!

Regional Strategy

We have seen consistent growth in project enrollments outside of the Portland Metro.



Already in January & February of 2016 we have almost the same number of new enrollments outside Portland as we do in the Metro area!

Regional Strategy

We encourage participation in our program through the region by:

- Highlighting local projects in cities outside Portland in promotional materials and marketing efforts
- Providing individualized outreach through local staff throughout the region who are connected to communities outside of Portland
- Providing 6 locations for remote gatherings for AFE
- Planning regional AFE training opportunities outside of Portland

New Buildings Training: AFE 2.0

Advanced training series; 2 or 3 planned per year
Content is focused on specific techniques or technologies
Attendance is limited, with special invitations to key designers/allies

June 16	*Energy Modeling for Architects* Presenters: Kjell Anderson, AIA, CSBA, LEED AP BD+C
August	*Advanced Envelope Design* Presenters: Marty Houston, Walsh Construction, and Ken Roko, Façade Group
Sept / Oct	*Using EDAPT to inform Design (tentative date and title)* Possible Presenters: Glumac, Ankrom Moisan Architects, Daimler

Building Energy Simulation Forum (BESF)

Building Energy Simulation Forum

- Longstanding series for energy modelers
- 6 planned per year
- Content is heavy on energy analysis and simulation
- Open to the public, but aimed at energy analysts and engineers

BESF in 2016

February: Accelerate Performance: Achieving Superior Energy Performance through Performance-based Procurement

- Adam McMillen, Director of Energy Consulting, Seventhwave
- Jennifer Scheib, Engineer, NREL

April: Stay Ahead of Advancing Energy Codes with the Advanced Buildings New Construction Guide

- Sean Denniston, Advance Buildings Program Manager, NBI

June: Addressing Resiliency and Energy Efficiency with Combined Heat and Power

- Marcia Karr, PE, Washington State University, Energy Program

August: Energy Modeling of Dedicated Outdoor Air System (DOAS) for a Small Commercial Pilot

- Amy Montgomery, RDH Building Engineering

October: Department of Energy Building Energy Codes Program

December: TBD EDAPT Case Study

2016 Attendance Projections

We are expanding the number of training options and broadening the topics at these events. We predict that this will result in lower average event attendance, but an overall increase in the number of individual people attending trainings in 2016.

Event	Goal (Average Attendance)
Allies for Efficiency	100 per event
Allies for Efficiency – Regional Trainings	30 per event
Building Energy Simulation Forum	50 per event
Allies for Efficiency 2.0	25 per event

Partnerships

- New strategy in 2016 – expanding our partnerships
- Leverage relationships with other organizations, avoiding event & training ‘fatigue’ for audience
- Reach additional sectors in the market
- More regional leverage

New Buildings Trainings - Partnerships

NEW in 2016

Developer Roundtable

Connects building owners, developers and banks. The goal is to support sophisticated financial decision-making regarding advanced building technologies and strategies that demonstrates the return on investment.

- Portland Business Journal as potential media partner
- Path to Net Zero focus
- Developed with New Buildings Institute
- Focus on developers specifically
- Targeted for September

New Buildings Trainings - Partnerships

NEW in 2016

Association of Energy Engineers (AEE)

Partnering on quarterly educational forums targeted at engineers. Will help to position our program as resource in the field and connect with additional sector of the engineering community by simply partnering on existing events.

- Partnering with AEE on 4 trainings in 2016
- Similar to BESF, but focus will be more technical and based on systems energy analysis, rather than modeling/simulation
- First one on March 9th titled “Improving Steam Systems”

Thank You

Jessica Iplikci
Business Sector Manager

EnergyTrust of Oregon