Conservation Advisory Council Agenda -- REVISED

Wednesday, June 28, 2023
1:30 – 4:00 p.m.

Hybrid meeting

- Virtually on Zoom—register at https://us06web.zoom.us/meeting/register/tZEsdeusrz0rGNAqiZEMol8l-yV5bkWCmY0S
- In-person at Energy Trust offices—421 SW Oak St, Suite 300, Portland, Oregon; masks are welcome but not required

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11:30 Networking and Lunch—Council Members Only
Prior to the CAC meeting, a networking and lunch will be held from 11:30 – 1:15 for CAC, RAC and DAC members, board liaisons and some staff. The location is the same as this meeting: Energy Trust offices—421 SW Oak St, Suite 300, Portland, Oregon. Email your attendance and any dietary restrictions to Hannah as soon as possible.

1:30 Welcome and Introductions

1:35 Community Agreements

1:40 Partner Spotlight: PGE Smart Grid Test Bed Collaboration *(inform)*
Portland General Electric and Energy Trust staff will share an overview of the Smart Grid Test Bed Collaboration, a collaborative investment in energy efficiency and load flexibility in a North Portland neighborhood funded by a grant from the U.S. Department of Energy.

Presenters: Megan Greenauer, Energy Trust Communities and New Initiatives Program Manager; Tim Treadwell, PGE Customer Technology Development Manager

2:05 New Buildings Program Update *(discuss)*
Staff will provide an update and seeks council discussion on New Buildings program design changes in light of commercial code updates and a current OPUC cost-effectiveness exception.

Presenter: Shelly Carlton, New Commercial Construction Sr. Program Manager

2:30 Evaluating Non-Energy Benefits of Utility Customer Arrearage Reduction *(inform)*
Energy Trust updated an analysis to quantify the non-energy benefits associated from energy efficiency investments reducing utility customer arrearages (or debt from past due payments on utility bills). The analysis was originally conducted and results presented to CAC in August 2021. Upon request from the OPUC to refresh the analysis staff reassessed the study. Findings demonstrate that the benefit of reducing utility customer arrearages is limited to a specific set of measures and Energy Trust recommends that policy options beyond attempting to quantify this non-energy benefit be explored to reach the customers that are most likely experiencing arrearages.

Presenter: Jake Kennedy, Planning Project Manager

3:00 Break

3:05 Hybrid HVAC Pilot Overview *(discuss)*
The 2023 budget and action plan include design and launch of a Hybrid HVAC pilot; this was previewed to CAC in September 2022. Today, staff will describe hybrid (dual fuel) HVAC systems and provide an overview of the Hybrid HVAC pilot initiative that is scheduled to launch in about two months. The pilot initiative is being designed in collaboration with the OPUC and our partner utilities.

Presenter: Andrew Shepard, Residential Sector Program Manager

3:35 Board Member Introductions *(inform)*
Energy Trust's board of directors recently welcomed three new members: Jane Peters, Ellsworth Lang and Bill Tovey. We've invited them to introduce themselves to the council.

Presenter: Danielle Rhodes, Board Services Administration Manager

3:50 Member Announcements, Suggestions for Future Meetings

3:55 Public Comment

4:00 Adjourn

Meeting materials (agendas, presentations and notes) are available online.
Next meeting is Wednesday, July 26, 2023, 1:30 – 4:30 p.m.

Conservation Advisory Council Meeting Notes
April 19, 2023

Attending from the council:

Andy Cameron, Oregon Department of Energy
Lisa McGarity, Avista
Charity Fain, Community Energy Project
Noemi Ortiz, Cascade Natural Gas
Laney Ralph, NW Natural
Jake Wise, Portland General Electric
Becky Walker, NEEA
Kerry Meade, NEEC
Kari Greer, Pacific Power
Tina Jayaweera, NWPCC
Jeff Bissonnette, NWEC
Anna Kim, Oregon Public Utility Commission

Attending from Energy Trust:

Hannah Cruz
Elizabeth Fox
Elaine Dado
Tom Beverly
Jay Ward
Themba Mutepfa
Greg Stokes
Steve Lacey
Andy Nix
Amanda Thompson
Tara Crookshank
Alanna Hoyman-Browe
Alex Novie
Cheryle Easton
Sloan Schang
Cameron Starr
Shelly Carlton
Sue Fletcher
Mark Wyman
Thad Roth
Cody Kleinsmith
Michael Colgrove
Danielle Rhodes
Melanie Bissonnette
Julianne Thacher
Amanda Potter
Adam Bartini
Jackie Goss
Amanda Zuniga
Kathleen Belkhayat
Taylor Ford
Wendy Gibson
Jeni Hall
Mia Deonate

Others attending:

Candice Norton, Resource Innovations
John Molnar, Rogers Machinery
Benedikt Springer, CAPO
Ross Ferguson, ICF
Melanie Stutler, Taper Solutions
Chris Smith, Energy 350
Henry Lorenzen, Energy Trust board
Louis Bartlett, ICF
Brooke Landon, CLEAResult
Jenny Sorich, CLEAResult
Kheoshi Owens, Empress Rules
Peter Therkelsen, Energy Trust board and CAC liaison

1. Welcome and Announcements

Hannah Cruz, senior stakeholder relations and policy manager, convened the meeting at 1:30 p.m. via Zoom. The agenda, notes and presentation materials are available at www.energytrust.org/wp-content/uploads/2023/01/CAC-Packet-April-2023.pdf.

2. Council Membership Changes

Topic summary

Hannah Cruz discussed recent member changes and thanked council member Tim Hendricks, who is retiring and stepping down from the council after volunteering since 2017. Tim has been

a lead facility manager, including for Unico Properties, and at many downtown buildings over the years. He represented Building Owners and Managers Association on the council. Tim championed commercial Strategic Energy Management and many other energy efficiency efforts in buildings of all sizes and age, including work on the historic Montgomery Park.

Discussion
The council thanked Tim for his time and service.

Next Steps
None

3. How We'll Work Together *(continued from February)*
Topic Summary
Hannah Cruz continued the discussion on developing community agreements—agreed upon ways in which council members will behave and hold each other accountable while working together. Council members were placed into breakout rooms to develop community agreements and share back with the group. Discussion questions are included in the Conservation Advisory Council meeting packet.

Discussion
Council members see community agreements as vitally important to respectful discourse and participating in a safe space (Jake Wise).

Members from breakout group one highlighted the importance of trust, which came from meetings and small groups that went well. There is a need to build a trusting framework and good facilitation. This means investing upfront in small groups and meetings to get to know each other, which pays off in the end, especially when healthy conflict is needed or there is contentious subject matter. Members added that the council has a wide variety of experience and backgrounds, so it's helpful to have summaries, pros/cons, background information and relevance for the various groups and represented entities. Anything to help the wide variety of members engage is helpful.

Council members from breakout group two highlighted a need to support moderators as they work to uphold agreements and remember that members are working together. If one person dominates a discussion, others need to speak up and inject their ideas. They mentioned a need for clear goals and expectations, along with clarity about what needs to happen next. The group also highlighted the importance of reading materials in advance, at least at a high level.

Breakout group three pointed out the importance of strong facilitation. Meetings that have gone well have been characterized by good participation from everyone, due to good facilitators. Meetings are less interesting when they focus on listening to only one or two speakers. Strong facilitation helps encourage participation.

Members stated that virtual tools, like pulse polls, are helpful in virtual meetings. Body language is important, and it may be helpful to hold at least some meetings in-person. It's also important to respect everyone's time by meeting for only as long as needed. Effective time management is important. Members also mentioned that trust-building is important, but some people may be less comfortable with sharing personal information. Ice-breaker questions may contribute to discomfort and should be considered carefully.

Staff added that having the group itself commit to being a community and helping facilitators is important.

Next steps

Hannah Cruz invited additional feedback. Notes from the discussion will be sent out to council members as an email or shared at a future meeting.

4. Strategic considerations and market insights

Topic Summary
Council members were asked to share insights about what they see in the market that Energy Trust should consider when planning for the coming year and beyond. This was the first of two sessions focused on strategic considerations. The session was facilitated by Alanna Hoyman-Browe, who is working with Energy Trust on the budget and planning process, with a specific focus on stakeholder engagement. Members were asked to comment on industry trends, customer needs and emerging opportunities from their perspectives.

Discussion
Industry Trends:

Members stated that one of the biggest issues is with respect to labor. Oregon employment department 2030 projections show a 20% or greater increase in need for electricians and plumbers (Jake Wise). Members also mentioned big picture changes and energy affordability issues for customers persist even with new low-income bill discounts. In reality, rates will continue going up. Even with unprecedented investment in energy efficiency it's unclear how low-income households will access programs and services. Community Energy Project is assisting with households that have been left behind in multiple energy transitions over the years. A staggering number of homes aren't ready for investments because of deferred maintenance. These include roofs needing repairs, unsafe or old electrical conditions and other things Energy Trust doesn't fund. There is also a trend toward greater public interest. People want to know more, not just about their own homes, but also about broader transitions at utilities. They want to know how peak load management impacts them personally and for resiliency. They want to be engaged more (Charity Fain).

Council members added that on the policy side, there is unprecedented need to work together to ensure collaboration and avoid overlapping efforts. There is a workforce development need, in addition to heating, ventilation and air conditioning systems (HVAC), which is dire in rural areas. Qualified energy auditors are needed, especially in rural areas. Oregon Department of Energy (ODOE) is attempting to make an impact in that area. The pending Senate Bill 870 alone could change staffing and logistical needs for ODOE (Andy Cameron). Members also mentioned that a lot is happening with the climate, such as erratic weather patterns and substantially lower levels of water in the hydro system in the Seattle area. Power companies there may need to purchase more power, which will impact customers downstream. More people and organizations are entering the market and showing interest, which creates more murkiness and uncertainty (Kerry Meade). Council members also said they would like to work with Energy Trust and ODOE on rural HVAC and other contractor development. There is high interest in getting services to far rural/frontier communities (Kari Greer).

Customer Needs:

Some council members pointed out that they help clients navigate through available resources, but there is still a current and projected need for navigation services, with so many opportunities – both now and in the future. People are having trouble figuring out who to speak with. Agencies also need help identifying the right resources (Andy Cameron, Charity Fain). Regulated multifamily is one thing, but other rental buildings need to be upgraded and no one knows quite how to solve the problem (Charity Fain). About 50% of Pacific Power territory is in rental units, which are denser in some places than others. A serious look is needed for ways to support renters, along with coordination of funds as federal funds get allocated. Smaller cities

and tribes may get these funds but not have the bandwidth or expertise to use them. It will be important to support them (Kari Greer).

Council members also stated that there is a lot of money floating around and discussion of putting heat pumps into people's homes. There is a substantial need for contractor training to ensure quality installation. The market may not be developed enough for the money coming in (Kerry Meade). Capacity issues often come up. There are a lot of resources to push out into the community, but many agencies are at capacity. They may not be able to distribute funds to individuals. Cascade Natural Gas is creating a consumer advisory group. Thinking is needed around how to alleviate capacity issues (Noemi Ortiz). It's important to consider how to effectively distribute these dollars. A better understanding of program eligibility requirements is needed, which aren't consistent between state and federal programs. Additionally, deferred maintenance requirements need to be understood. Over 1/3 of Portland General Electric customers have electric resistance heating. Of those, 80% are renters and 70% of them are in condos or apartments. Best use of funding needs to be understood well ahead of 2024 (Jake Wise).

Opportunities:

Council members see an opportunity in looking at commercial buildings more holistically when combined with vacancy rates due to the pandemic and trends in commercial real estate. Legislation may help to make this a big opportunity. HVAC upgrades are a big focus area for funding. Envelope improvements may become a good opportunity to help resize HVAC systems (Becky Walker). The Portland Clean Energy Community Benefits Fund (PCEF) is huge in the Portland area, and how Energy Trust thinks about it is important. PCEF wants to do 300 low-income households per year with a $45,000 investment per household. There are major opportunities for how to use resources creatively. If Portland has that kind of investment, how can other parts of the state do similarly (Charity Fain and Jake Wise)? It's important to support the nonprofits going after PCEF dollars with technical assistance, grants and programs. Affordable multifamily is fast-tracked within PCEF's investment plan. There is a big opportunity for deployment of high-efficiency water heating, heat pumps and solar (Jake Wise).

Strategic Priorities:

Council members recommended that strategic priorities should include making services accessible, reducing jargon, reducing unnecessary requirements and ensuring that more customers get access (Lisa McGarity). Affordability should also be a priority. Portland General Electric's income-qualified program can be spread by increasing participation in energy-efficiency measures among customers (Jake Wise). The council added that Energy Trust has a good role to play in convening many of the active groups that focus on education. The Low-Income Solar Working Group is an example of Energy Trust playing that role. There is a big learning curve in the energy sector, and Energy Trust could play a much bigger role in educating. Energy Trust can help develop community-based organizations to roll programs out – not just focus on workforce development. Communities can't be left behind (Charity Fain). The council also mentioned that a lot has been going on with Washington new construction code, making it important to watch as it will diffuse into Oregon (Becky Walker). Staff summarized by saying that a lot is happening in late 2023 and 2024, leading to both excitement and trepidation. Not leaving people behind in the influx of funding is a tall order. Navigating and being Energy Trust's own support mechanism will be important (Hannah Cruz).

Next Steps
Alanna will return in July for deep-dive sessions where council members' expertise will be important. There will be a joint council meeting in October, to report on what was learned.

5. 2023 State Legislative Update

Topic Summary

Jay Ward provided an update on energy-related bills being monitored during Oregon's 2023 state legislative session, including a compact fluorescent/linear fluorescent bill (House Bill 2531) and the Resilient, Efficient Buildings bill package (Senate Bill 868, Senate Bill 869, Senate Bill 870 and Senate Bill 871).

Over 2,000 bills were introduced in January. Energy Trust began tracking 200 of them, but the number has fallen to about 80. The presentation slides include details on 12 important bills and a reminder that Energy Trust does not lobby or advocate in these or any settings.

Discussion

Council members would like to see an analysis of the lighting savings impacts from House Bill 2531 if it passes (Tina Jayaweera).

Next Steps

If the bill regarding lighting passes, Energy Trust will need to determine steps for the Business Lighting program and update the council.

6. Workforce development strategy, definitions and goals

Topic Summary

Kathleen Belkhayat, commercial program manager, and Cameron Starr, senior customer service strategy manager, provided an update on Energy Trust's workforce development working group. In 2022, Energy Trust formed a workforce development workgroup to share ideas and come up with a shared definition and vision for Energy Trust's role in workforce development. Nine months in, staff have developed a foundation and are formalizing goals. Staff are eager to receive input from stakeholders as existing work moves ahead and new strategies are developed.

See presentation slides for full details.

Discussion

Energy Trust works with Blueprint Foundation in a small capacity. The organization works with Black youth in the Portland area that primarily focus on residential construction. As part of high schoolers internships, Energy Trust is facilitating treasure hunts.

Some content from Bonneville Environmental Foundation is being used in the 3rd-5th grade after school energy class.

Council members pointed out that Community Energy Project is a licensed contractor and could use staff development in energy audits, HVAC sizing and technical skills. Community-based organization staff are sometimes left out of these kinds of programs (Charity Fain). Attendees pointed out that Black women were included in the presentation and expressed appreciation (Kheoshi Owens). Members asked what kind of support contractors are receiving for people of color (Lisa McGarity). Staff responded that Energy Trust is planning to launch diversity, equity and inclusion training this year, and serving low-income customers is the current priority (Cameron Starr).

Attendees stated that the approach is very intentional, and that Energy Trust has come a long way since 2018. It's important to prevent harm, questioning how mentors are being prepared to work with mentees and how cross-cultural conflict will be handled, including a mediator on staff to help navigate (Kheoshi Owens). Staff agreed that Energy Trust has grown, and staff appreciate the acknowledgement and collaboration. Staff added that directions for feedback are provided, and feedback can be emailed to the workforce development team or sent to

Lighthouse Services, as a third party. Lighthouse feedback and concerns are sent to a select group on Energy Trust's executive team. Energy Trust will consider a mediator for cultural conflicts as recommended by the council (Kheoshi Owens, Cameron Starr).

Next Steps
Staff will continue with its work and update the council at a later meeting as more progress is made.

7. Public comment
There was no additional public comment.

8. Adjournment
The meeting adjourned at 3:58 p.m. Meeting materials are available online. The next meeting of the council will be Wednesday, May 17, 2023.

Conservation Advisory Council Meeting Notes

May 17, 2023

Attending from the council:

Andy Cameron, Oregon Department of Energy
Charity Fain, Community Energy Project
Laney Ralph, NW Natural
Jake Wise, Portland General Electric
Becky Walker, NEEA
Kerry Meade, NEEC
Tina Jayaweera, NWPCC
Anna Kim, Oregon Public Utility Commission

Attending from Energy Trust:

Hannah Cruz
Elizabeth Fox
Elaine Dado
Debbie Menashe
Kate Wellington
Bayo Ware
Thad Roth
Dan Rubado
Themba Mutepfa
Natalia Ojeda
Jackie Goss
Tracy Scott
Sue Fletcher
Scott Leonard
Cory Hertog
Adam Bartini
Fred Gordon
Jeni Hall
Michael Colgrove
Mark Wyman
Marshall Johnson
Andi Nix
Kenji Spielman
Alex Novie
Gina Saraswati
Sarah Castor
Ryan Crews
Amanda Zuniga
Oliver Kesting
Steve Lacey
Amanda Potter
Lindsey Diercksen
Sletsy Dlamini
Tara Crookshank
Tom Beverly

Others attending:

John Molnar, Rogers Machinery
Candice Norton, Resource Innovations
Henry Lorenzen, Energy Trust board
Heather Salisbury, CLEAResult
Jonathon Belmont, Bonneville Power Administration
Shannon Todd, TRC Companies
Don MacOdrum, TRC Companies
Kelly Thomas, Oregon Department of Business and Consumer Services
Peter Kernan, Oregon Public Utility Commission
Jenny Sorich, CLEAResult
Kheoshi Owens, Empress Rules
Peter Therkelsen, Energy Trust board and CAC liaison
Naomi Cole, Konstrukt
Cory Fulton, CLEAResult
Brian Mayfield, CLEAResult

1. Welcome and Announcements

Hannah Cruz, senior stakeholder relations and policy manager, convened the meeting at 1:30 p.m. via Zoom. The agenda, notes and presentation materials are available at https://www.energytrust.org/wp-contents/uploads/2023/01/CAC-Packet-May-2023.pdf.

Hannah announced that Anna Kim from the Oregon Public Utility Commission will soon move to a new role as energy cost manager. After nearly five years as a council member, Anna hopes

for opportunities to make connections, stating that she enjoyed her time on the council as a forum to discuss these topics. A schedule and transition plan are in development as another member of the Oregon Public Utility Commission will attend in her place. The council thanked Anna for her time and contributions to the council and congratulated Anna on her new role.

2. Draft Community Agreements

Topic summary

Hannah Cruz discussed draft community agreements for the council. Establishing community agreements was added to the operating principles during the annual review this past February. Community agreements describe how the council behaves and works together and are important as Energy Trust changes the way it works internally, with stakeholders, program management contractors and external customers. As an advisory body, it's important that the council keep its community agreements in mind during all meetings and conversations.

The agreements are to also guide the behaviors and actions of the facilitator, presenters and participants. Staff drafted the community agreements based on discussions held at the last two council meetings. It is the responsibility for the entire council to agree to and hold to the community agreements.

Discussion

An attendee mentioned that principal community-based efforts have been in Residential and Energy Trust fell short of goals in 2022, particularly on the commercial side and asked if the community-based approach will be used for commercial also (Henry Lorenzen). Staff clarified that these community agreements focus on how the council will operate together, adding that they will help new members know what the expectations are. These do not discuss how the organization works with community-based organizations to serve customers (Hannah Cruz).

Council members stated that the draft agreements are good and capture the previous discussions (Kerry Meade, Andy Cameron). A council member questioning whether the statement around actions that marginalize others means words, or work being done that marginalizes groups. The council also questioned how actions will be identified and addressed, whether they should be called out in the moment, and whether the meeting facilitator will step in (Kerry Meade). Staff responded that these items tie into the section about backgrounds and experiences, leading to different perspectives on how presented information impacts different communities or groups. Council members are encouraged everyone to think of the agreements as "theirs" (Hannah Cruz).

Council members also pointed out a need to balance online interactions vs. in-person, adding that it's easy to overbalance in one direction or the other. People who live outside of Portland and may find it challenging to travel should be kept in mind (Anna Kim). Staff noted appreciation for the comment.

Next Steps

Staff will share the final community agreements and begin utilizing them in meetings going forward.

3. Residential Income Eligibility Refinements

Topic Summary

Marshall Johnson, residential senior program manager, discussed proposed changes to income qualifications for Savings Within Reach. Savings Within Reach provides increased incentives for income-qualified customers to help fill the gap between low-income services provided by other entities like Oregon Housing and Community Services and Energy Trust market rate incentives. It is delivered by trade allies and customers receive incentives as an upfront reduction in project costs. The trade ally is reimbursed upon completion of work.

The initial income qualifications resulted in a narrow band of eligible customers. Requirements were refined to align the floor of the Savings Within Reach incentive to pick up at the ceiling for low-income services, while aligning the Savings Within Reach maximum incentive with the state maximum for moderate income. Energy Trust is considering an increase to maintain these alignments.

Discussion
Council members asked what the percentage is in AMI (area median income) and SMI (state median income) terms, adding that 200% of the federal poverty level is the same as 60% of SMI (Jake Wise). Staff responded that the 2023 maximum column in the presentation shows 1.2 times the state median income and added that there are pros and cons to using state vs. federal standards (Marshall Johnson).

Community Energy Project (CEP) has a paper that explains the differences between state median income and federal income and discusses the pros and cons. It's would be advantageous to align with federal Inflation Reduction Act (IRA) rebate programs as it will be easier and less complicated for contractors who want to stack incentives. Council members noted that Energy Trust should consider what's most generous and flexible. People who fall just above the guidelines are often very much in need, especially as costs have increased. Low-income incentives don't cover the full cost of projects due to price increases. There is a lot of deferred maintenance at the low and near low-income levels. Allowing more access to higher incentives provides many benefits (Charity Fain).

An attendee from the Energy Trust board of directors stated that people who qualify for these programs may have less time or resources to learn about Energy Trust programs and asked if there are efforts to design outreach and marketing that communicates about the programs to the people they're designed for (Peter Therkelsen). The council responded it often isn't an issue of time, but they don't have access due to income. Even at moderate income levels, people can't afford the costs. Some groups feel like they shouldn't bother learning more because they don't have enough money and decide the offers aren't for them or their community. Marketing is helpful, but contractors are where the conversations happen (Charity Fain).

Staff added that Energy Trust programs are traditionally delivered by trades. Energy Trust has been successful at engaging higher-income customers. The Savings Within Reach customers often own their own properties and can obtain financing. Energy Trust now works with community organizations like Community Energy Project to assess homes and determine priorities. Priority is now on exploring how we get information to communities and customers who don't have access to community-based organizations (Marshall Johnson).

Next steps
The discussion will continue at a future meeting when Residential program plans are further along.

4. New Homes Program and Billing Analysis
Topic Summary
Dan Rubado, planning and evaluation senior project manager, and Scott Leonard, residential senior project manager, discussed the recent impact evaluation of the EPS New Construction program. An impact evaluation looks at the value of the savings claimed and compares them against actual results whereas a process evaluation looks at the effectiveness of a program and how it works. This evaluation included three different contracted program implementors: Portland Energy Conservation, Inc., CLEAResult and TRC.

EPS encourages building homes at least 10% beyond code and the average EPS home is over 20% more efficient than a typical newly built home.

The impact evaluation findings indicate that overall, program homes didn't save as much energy as expected, while non-program homes used less energy than expected. This resulted in overall realization rates of 18% for electricity savings and 21% for gas savings.

Discussion
Council members mentioned that there are options for what happens with a code-based home vs. a program home and asked if Energy Trust had questioned builders about what they would have done without the program (Tina Jayaweera). Staff responded that there are base cases for what needs to happen within code. If a builder decides to do something different on a code home, it could come in through on the data. Oregon Building Codes Division has indicated similarly. Staff added that a small number of large volume builders who stated that the program influenced what they do were engaged. Builders wouldn't have gone above code without the influence of the program. The builders interviewed generally believed that other unenrolled builders were also building above code based on program influence in the market (Dan Rubado).

Energy Trust board of directors attendees asked about the extent of the EPS New Homes program's contribution to avoided cost savings in the Residential program, adding that it appeared to be about 25% on average between Pacific Power and Portland General Electric. Board member attendees also expressed concern about the accurate prediction of usage among code homes and that Energy Trust is claiming greater benefits than are being achieved (Henry Lorenzen). Staff responded that the savings percentage is higher for gas than electric utilities (Scott Leonard). The EPS program is primarily a gas-focused program with more than 80% of the homes being heated by gas. Staff added that there's some calibration needed in the modeling, and another issue occurs where builders may be building above code in code homes (Dan Rubado).

The council encouraged Energy Trust to look at market transformation influence. Northwest Energy Efficiency Alliance (NEEA) has a lot of influence on code and can also share an updated logic model. NEEA is looking at the influence of its own code program which may be helpful. With Regional Building Stock Assessment data, it may be possible to help look at characteristics in these models (Becky Walker). Staff stated that NEEA's code compliance studies are very helpful, and hope they'll continue (Scott Leonard). Staff added that the real purpose of NEEA and Energy Trust working together is market transformation and influencing code. When code is updated in a year or two, the difference between these homes and market baseline will disappear. The evaluation is important, but it should be interpreted within the context of market transformation. Staff noted market influence isn't the goal after with this evaluation. There are unit savings but also influence on builders. There is more work to do in connecting the dots (Fred Gordon).

Next Steps
New measure development, updating to the code, will happen next. Interested stakeholders can follow along through the budget process. Changes made to modeling or the design of the program will go into effect Q4 2024 at the earliest.

5. HB 2531 Update
Topic Summary
Hannah Cruz provided a brief update on HB 2531, a bill that prohibits the sale and distribution of certain compact fluorescent light bulbs and linear fluorescent lights. The bill has passed the House and its Senate policy committee. It awaits a final reading and vote in the Senate, which

is complicated by the multi-week Republican senator walk-out. At this stage in the session, Energy Trust is proceeding with plans as if the bill will pass. If passed, there is a significant savings impact to the business lighting initiative and customer impact on smaller businesses.

If adopted, changes will take effect on January 1, 2024 for CFLs and January 1, 2025 for linear fluorescents.

Discussion
None

Next Steps
Staff will provide an update during the fall budget and action plan presentations.

6. New Buildings Program Update
Topic Summary
Alex Novie, community and new initiatives sector lead, briefly summarized the New Buildings topic that will be covered at the next council meeting.

Commercial building code has changed, giving building owners and developers many more options to meet or exceed code. New Buildings focuses on support to push buildings beyond code, including training and education, technical support and early design support. The program has operated under an Oregon Public Utility Commission exception for some time due to the inability to assess baseline costs; the exception is not due to an issue with above-code buildings not being cost effective. With unlimited options to meet it, the new code makes it nearly impossible to determine baseline costs.

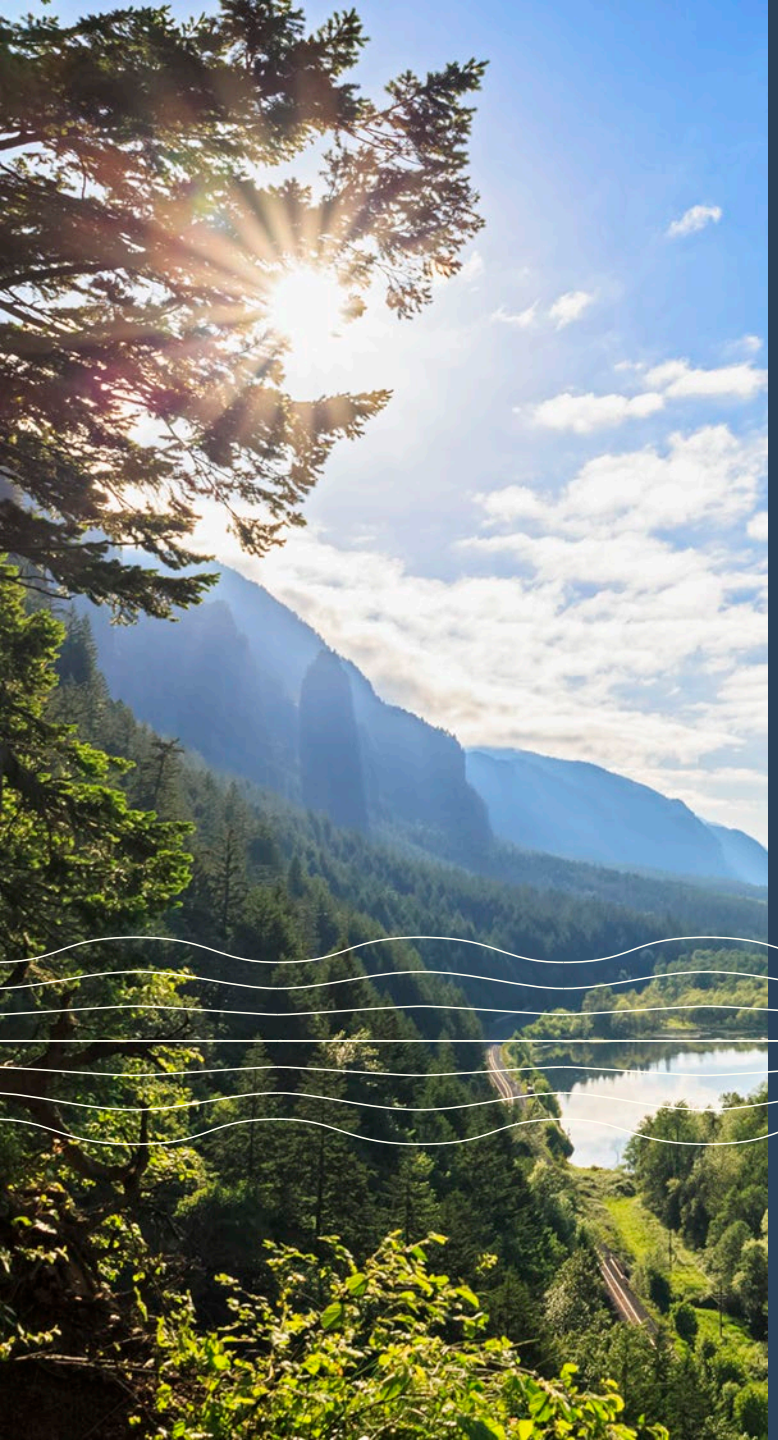
The program is looking at ways to expand the use of building science in the market, and ways to provide more building design resources for customers who might not otherwise have design teams. At the next council meeting, staff will discuss the findings of market research that is concluding soon.

Discussion
No discussion due to meeting time limitations.

Next Steps
Topic will return in June.

7. Member Announcements, Suggestions for Future Meetings, Public Comment
There was no additional public comment.

8. Adjournment
The meeting adjourned at 3:30 p.m. Meeting materials are available online. The next meeting of the council will be June 28, 2023. It will be a two-part, hybrid meeting and will also include lunch and networking with the Diversity Advisory Council and Renewable Energy Council.



Smart Grid Test Bed Collaboration

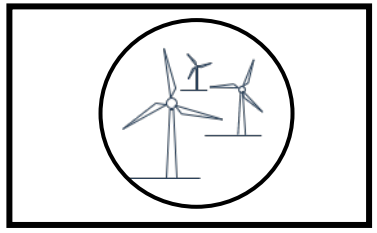
A Regional Partnership to Demonstrate the Operational Value of Flexible Loads

June 28, 2023

The utility landscape is becoming increasingly complex

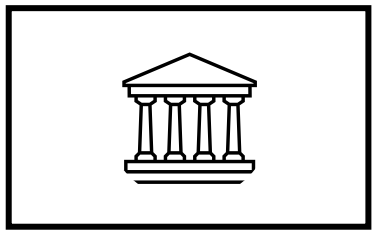
- We need to evolve grid capabilities to meet customer and community needs

Customer Expectations

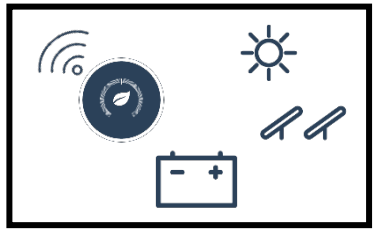


Regulatory Environment

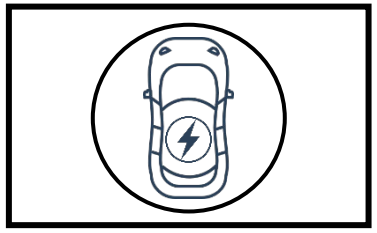
Evolving Energy Markets



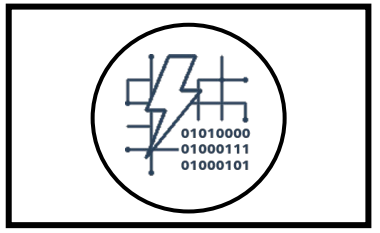
Distributed Energy Resources



New Dynamic Loads



Increased Network Complexity



Building a new business function.

Aligning Company Strategic and Businesss Operation

STRATEGIC PILLARS

DECARBONIZE:
Zero GHG Emission by 2040;
80% reduction by 2030

ELECTRIFY:
Leverage DERs and flexible load to meet customers' needs and keep the grid resilient as load growth increases

PERFORM:
Continue to meet customer needs and expectations by keeping power affordable and reliable and leveraging human-centered design principles

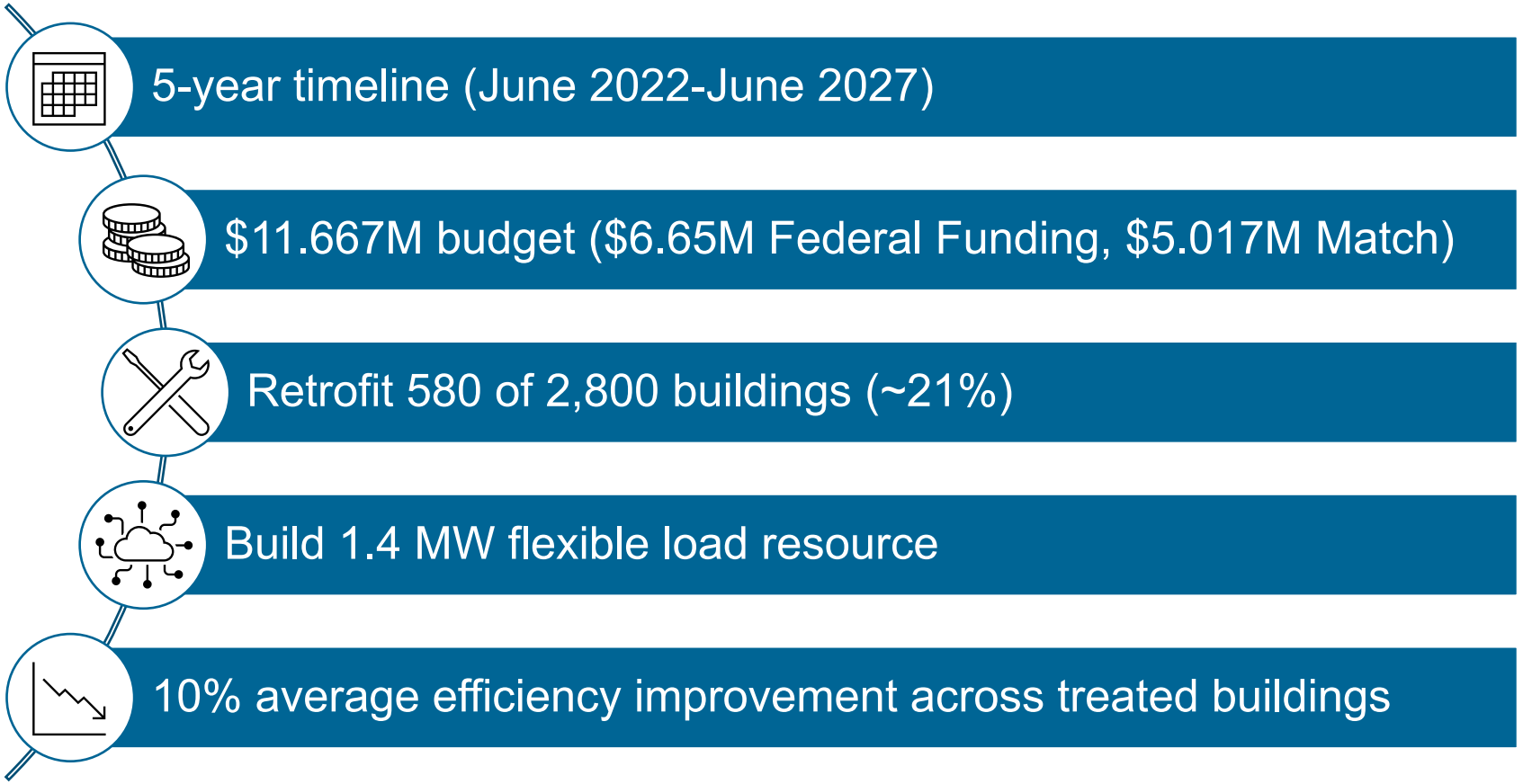
VPP OPERATING MODEL

Enable and scale a **fully-integrated, system** (people, processes, tools) that can effectively plan, manage, and optimize a network of **dispatchable DERs (utility-owned or not)** to achieve a **safe, reliable, and resilient clean energy future** where all customers are enticed to participate and benefit.

Field Demonstration of Flex Load Operation

Project Smart Grid Test Bed Collaboration Overview

- By the Numbers



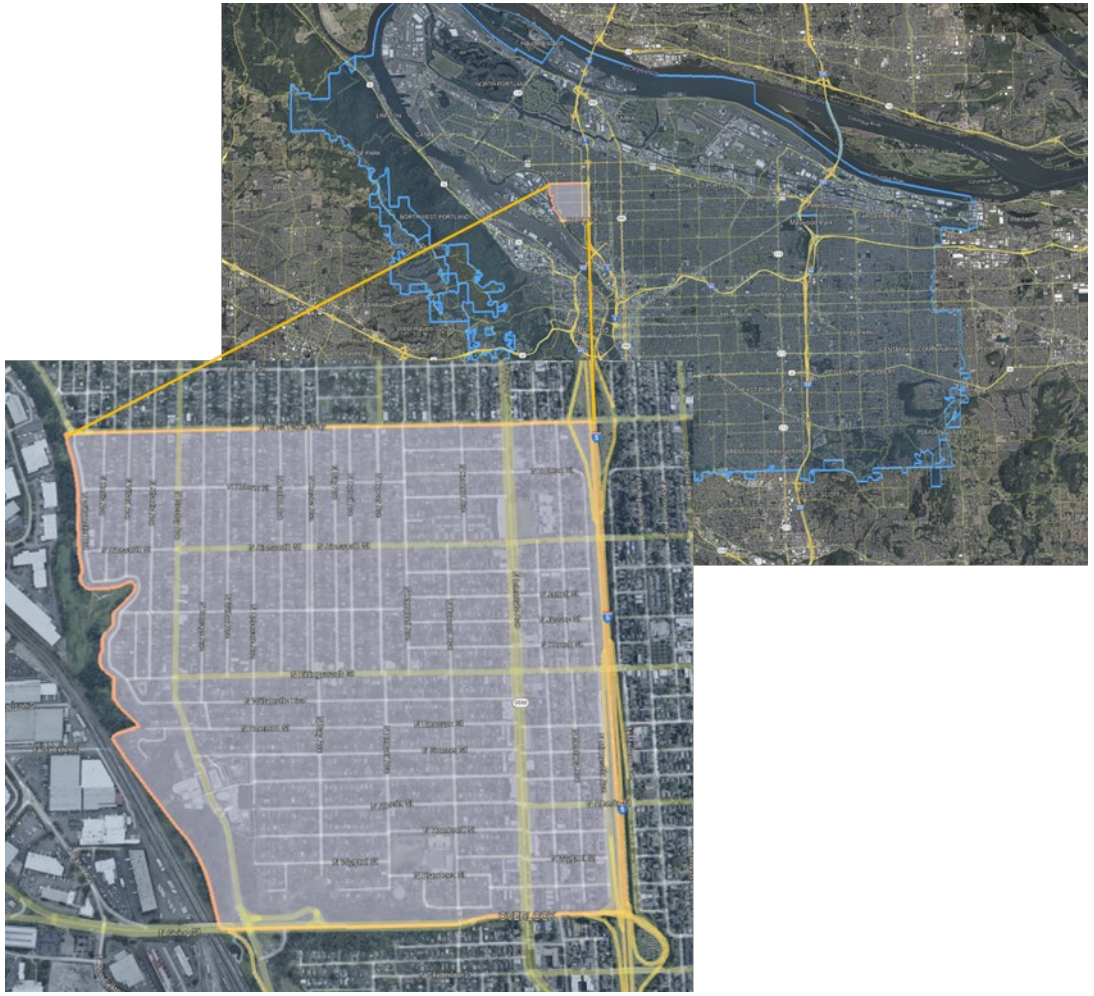
Distributed Energy Resources and Grid Services

- Testing Flex Load Capabilities
- Develop a 1.4 MW flex load resource within the study area consisting of:
  - Energy efficiency measures,
  - Connected devices (e.g., thermostats and water heaters),
  - Solar PV,
  - Energy storage, and
  - Managed EV charging
- Use Cases
  - Demonstrate bulk services (energy, capacity and frequency response)
  - Distribution services (capacity relief, power quality, and VoltVAR Optimization/Conservation Voltage Regulation)

Smart Grid Test Bed Collaboration Study Area

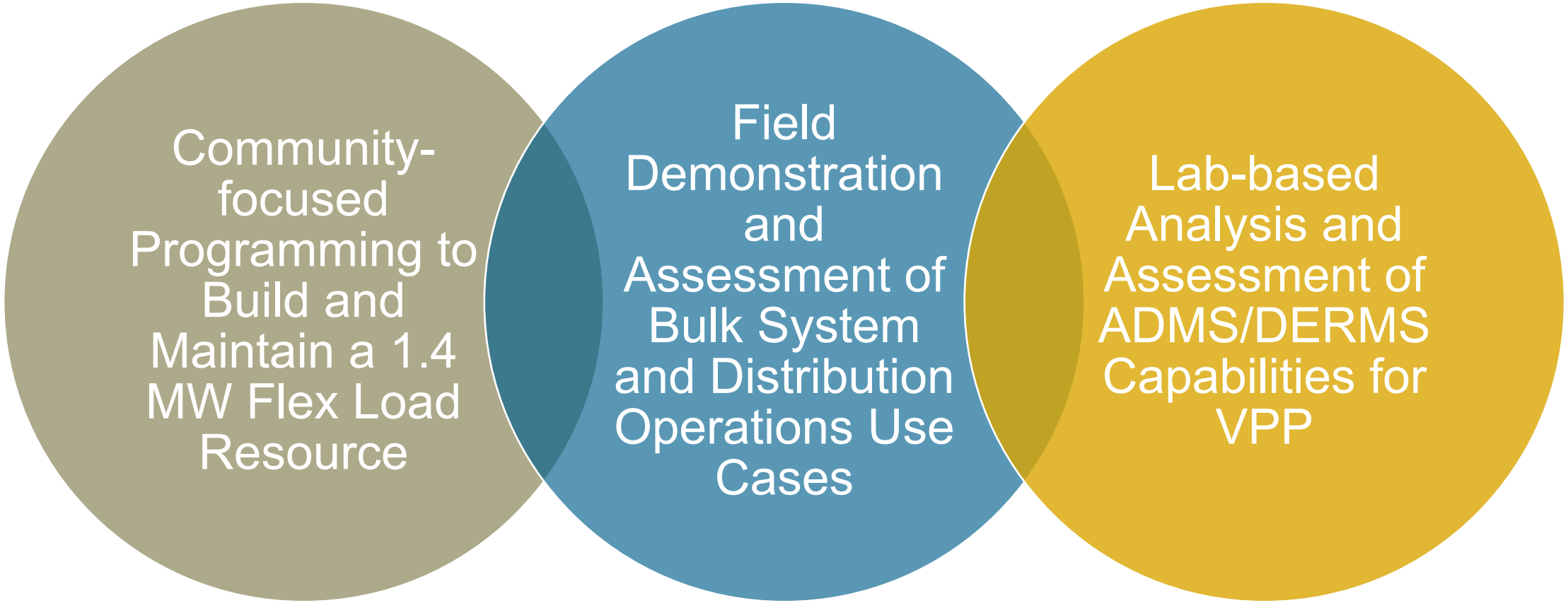
- Study Area Location

- The Overlook/Arbor Lodge community's roughly 2,800 buildings are a mix of:
  - Single-family (76.2%),
  - Multifamily (14.4%),
  - Commercial (9.4%).
- The single-family stock is largely pre-war (68% built before 1940), with an average size of ~1,500 ft^2.
- The multifamily stock consists primarily of smaller developments (2-4 units), however most of the multifamily residents (63%) live in larger complexes with 16 or more units.
- The non-residential stock is primarily small business and dispersed throughout the community



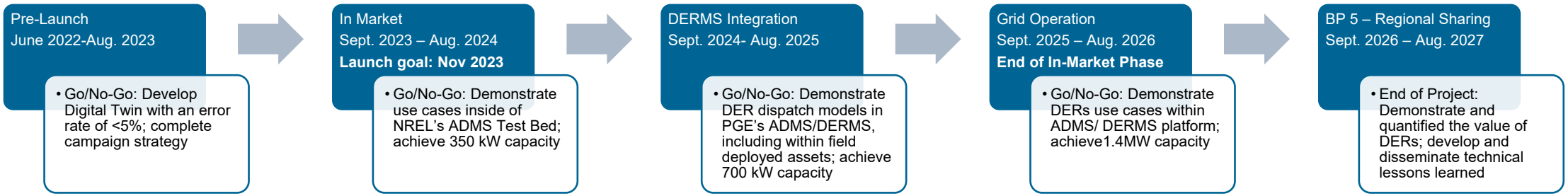
Smart Grid Test Bed Collaboration Workstreams

- Community Programming with Laboratory-Based Analytical Support



Project SALMON Timeline

- Budget Period Overview



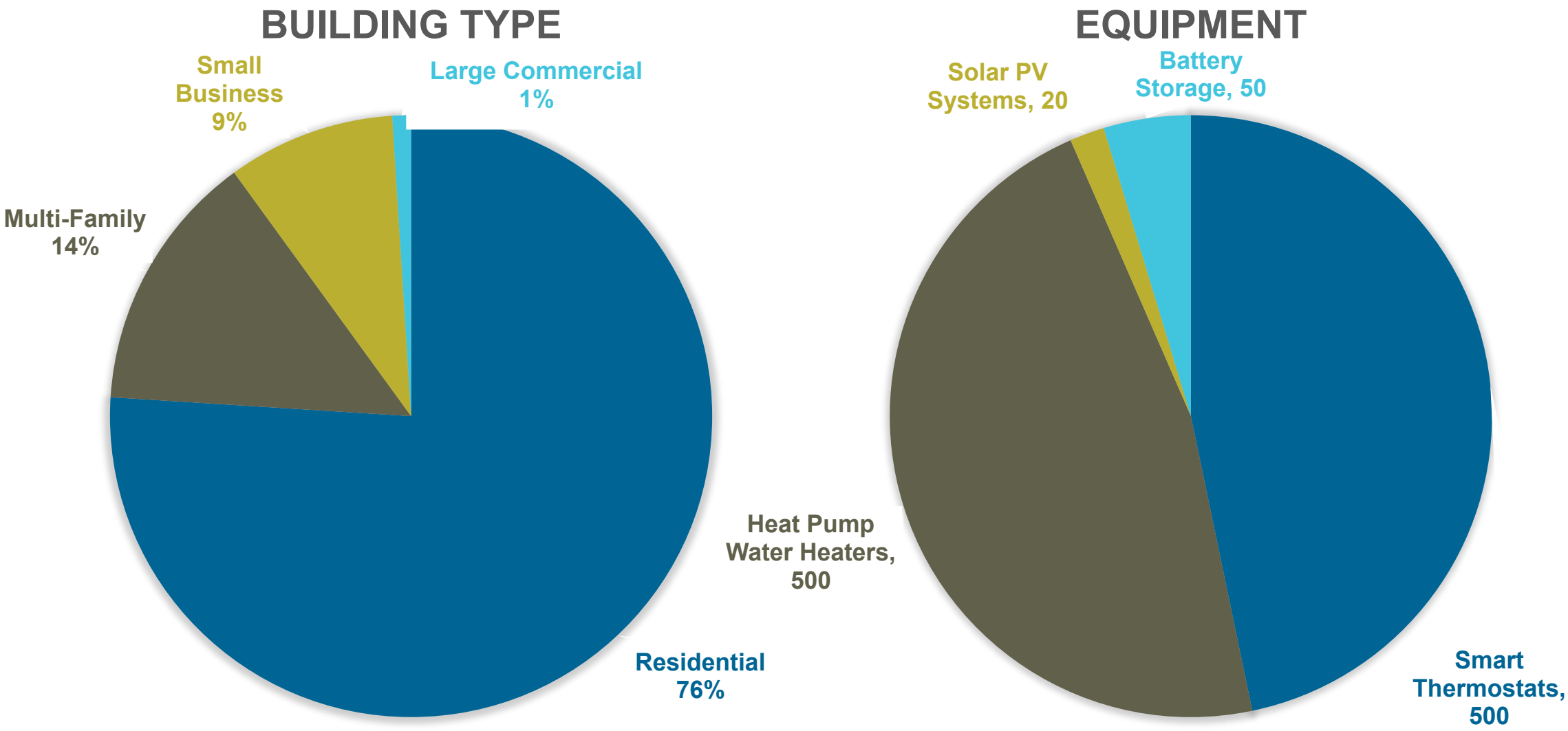
Energy Trust of Oregon

Smart Grid Test Bed Collaboration Opportunities

1. Forming new partnerships to solve community specific customer needs
2. Pairing energy efficiency with flex value
3. Alleviate constrained areas on power grid
4. Achieving additional benefits that go beyond energy efficiency
5. Reaching low to moderate income customer with new technologies and program strategies

Energy Trust of Oregon

Participation Estimates by Building Type, Equipment



Go-To Market Overview

Efficiency/Flexibility Programming

- Demand Response Incentives
- Smart Thermostats and HVAC upgrades
- Weatherization
- Heat Pump Water Heaters

Generation, Storage, and EVs

- Solar PV Systems
- Smart Inverters
- Smart Batteries
- Electric Vehicle Charging

Commercial Offering

- Small Business Incentives
- Multi-Family Offers
- Schools/Community Centers
- Large Commercial Storage Project

Smart Grid Test Bed Collaboration Program Offer Priorities

1. Offer all available Energy Trust Efficiency and Solar incentives
   - Right-sized additional incentives to increase participation on priority measures
2. Prioritize Flex Load Equipment
   - Smart Thermostats
   - Heat Pump Water Heaters
   - Smart Solar Inverter, Smart Battery Storage, and EVSE
3. Low Barriers to Participation
   - No pre-requisites: customers can pursue efficiency, flex load, or solar only projects
   - Community Energy Project serves all Low Income and BIPOC participants
4. Monthly payments for participation in Flexible Load program enrollment

Smart Grid Test Bed Collaboration Program Challenges

1. Complexity of the Offer:
   - Efficiency, equipment, solar, EV charging
   - Residential, Commercial, Multi-Family, Solar
   - Additional energy programs at city, state, federal level
2. New concepts, terms, technology for Smart Grid-related activities
3. Very small geographic area
   - Hard to predict participation rates
4. Challenges navigating new and grid-tied equipment

Ensuring Community Participation

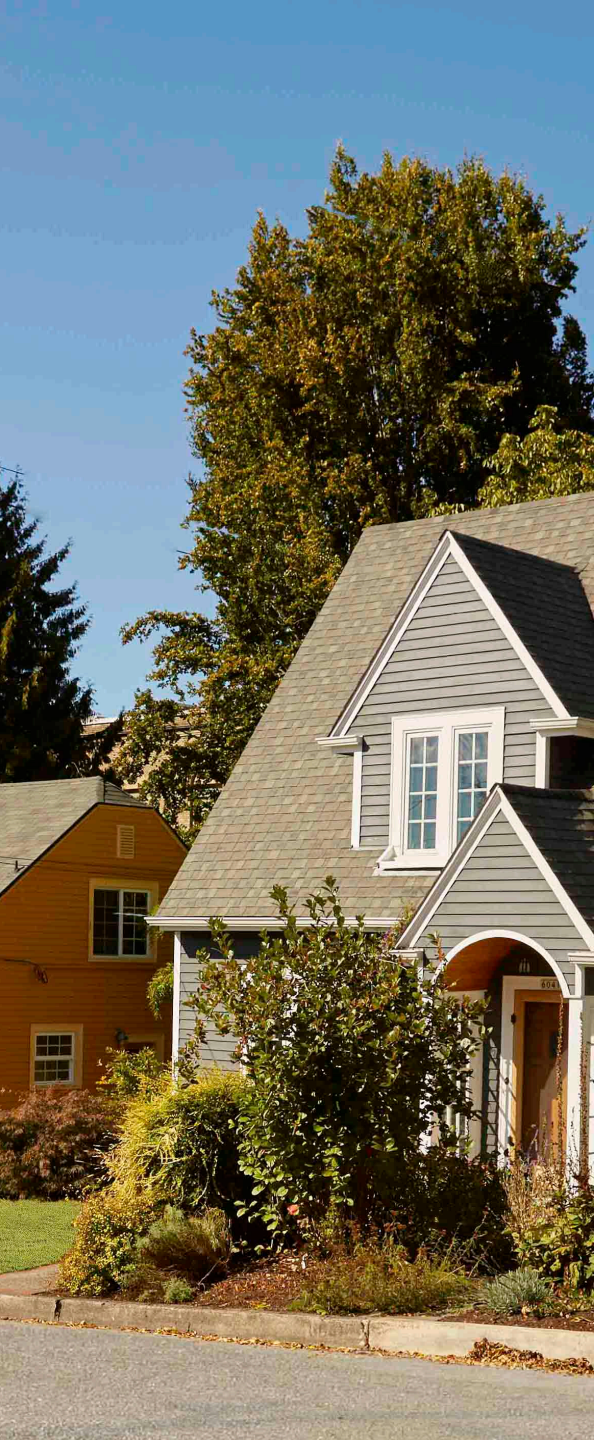
- Sector-Specific Campaigns
- Monthly On-bill incentives for Demand Response participation
- Community Energy Project (CEP) will serve ALL Low Income and BIPOC Homeowners
- Door-to-Door canvassing
- Community Events
- Solarize Campaign

Residential Customer Engagement Strategy

FREE Home Energy Score	• Provide upgrade recommendations • Capture home data for future outreach
Select Contractor Program	• Reduce contracting confusion • Expedite decision-making
Installer Training	• Commissioning for Flex Load equipment • Support customer behavior change
Enhanced Program Support	• Offer navigation • Technical support

Contractor Program Process

- Develop Contractor Participation Agreement and Orientation
- Outreach to current Energy Trust Trade Allies and BIPOC/women-owned and emerging businesses
- Technical training for grid-interactive equipment
- Refer Smart Grid Test Bed Collaboration customers to program contractor list
- Create a positive customer experience



Equity Initiatives

1. Community Energy Project delivers low-income full-service home energy retrofits

2. Qualified contractor list and workforce development
   - Prioritizing BIPOC/women-owned and emerging-business recruitment

3. Technical support
   - Contractor and occupant training for DR equipment integration

Hybrid (Dual fuel) Heat Pump Pilot

Conservation Advisory Council

June 28, 2023

Energy Trust of Oregon

Agenda

- Energy Trust pilots
- What is Hybrid (dual fuel) HVAC (HHVAC)
- Research objectives
- HHVAC pilot process to date
- High-level description of pilot design
  - Demographic focus, education and support
  - Home criteria
  - Pilot delivery, installation, quality assurance
  - Technical specifications
- Timing and budget
- Next steps

Energy Trust Pilots

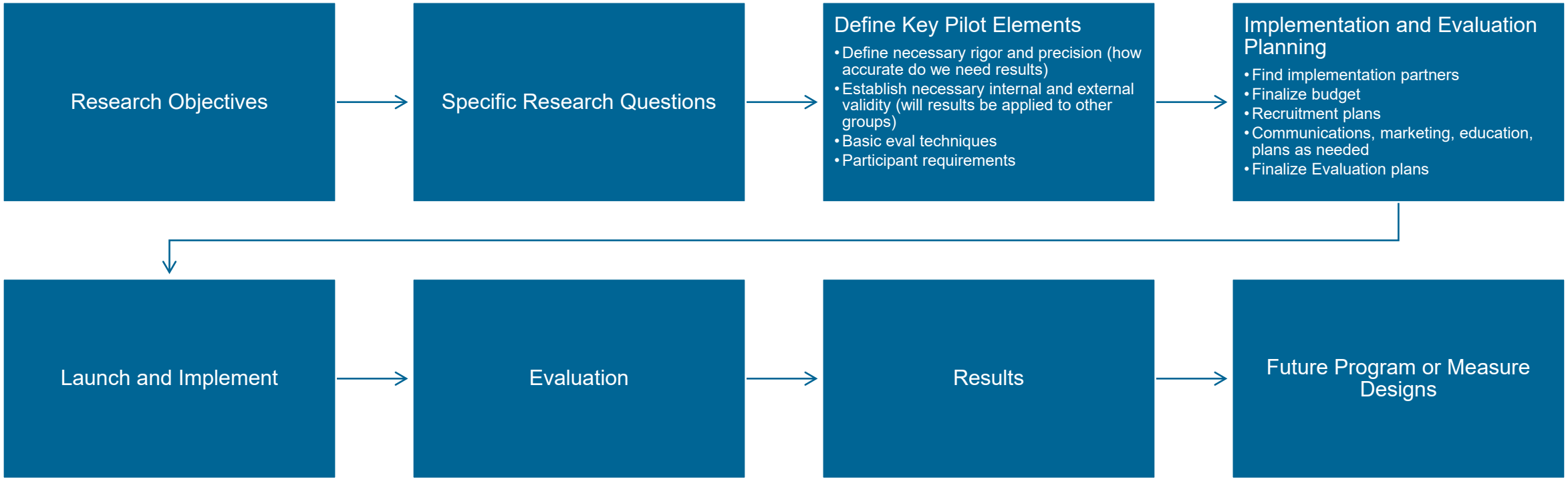
Energy Trust Pilots

Pilots are:

- Experiments seeking specific information to support decisions and actions.
- It is financially and technically feasible to answer questions through field experimentation and evaluation.
- The test is important to Energy Trust's success acquiring energy savings or generation in the future.

If measures are not cost-effective, total pilot spending is limited to $1.5 million. If over this cap, Energy Trust may request OPUC permission to proceed.

Research Pilot Best Practices

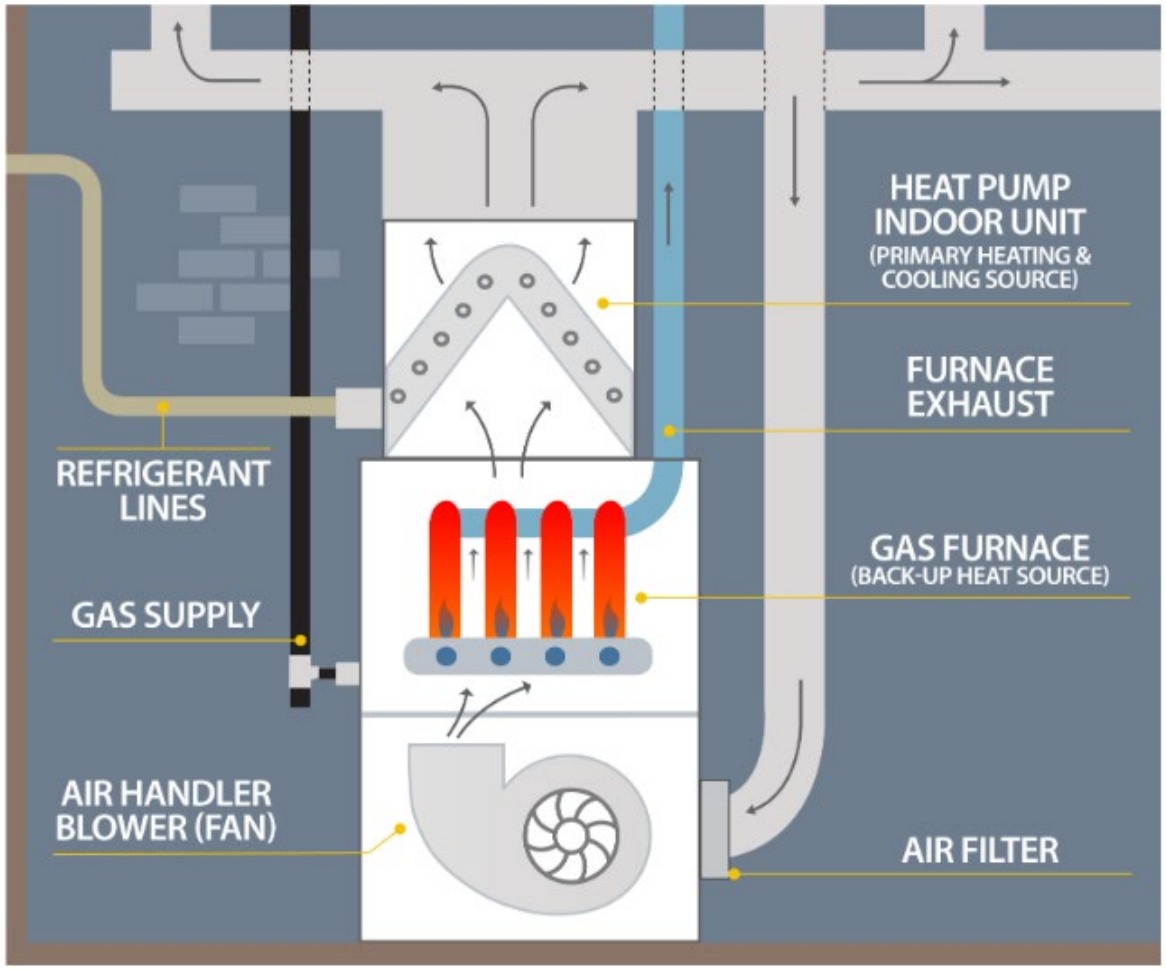


Hybrid (dual Fuel) HVAC (HHVAC)

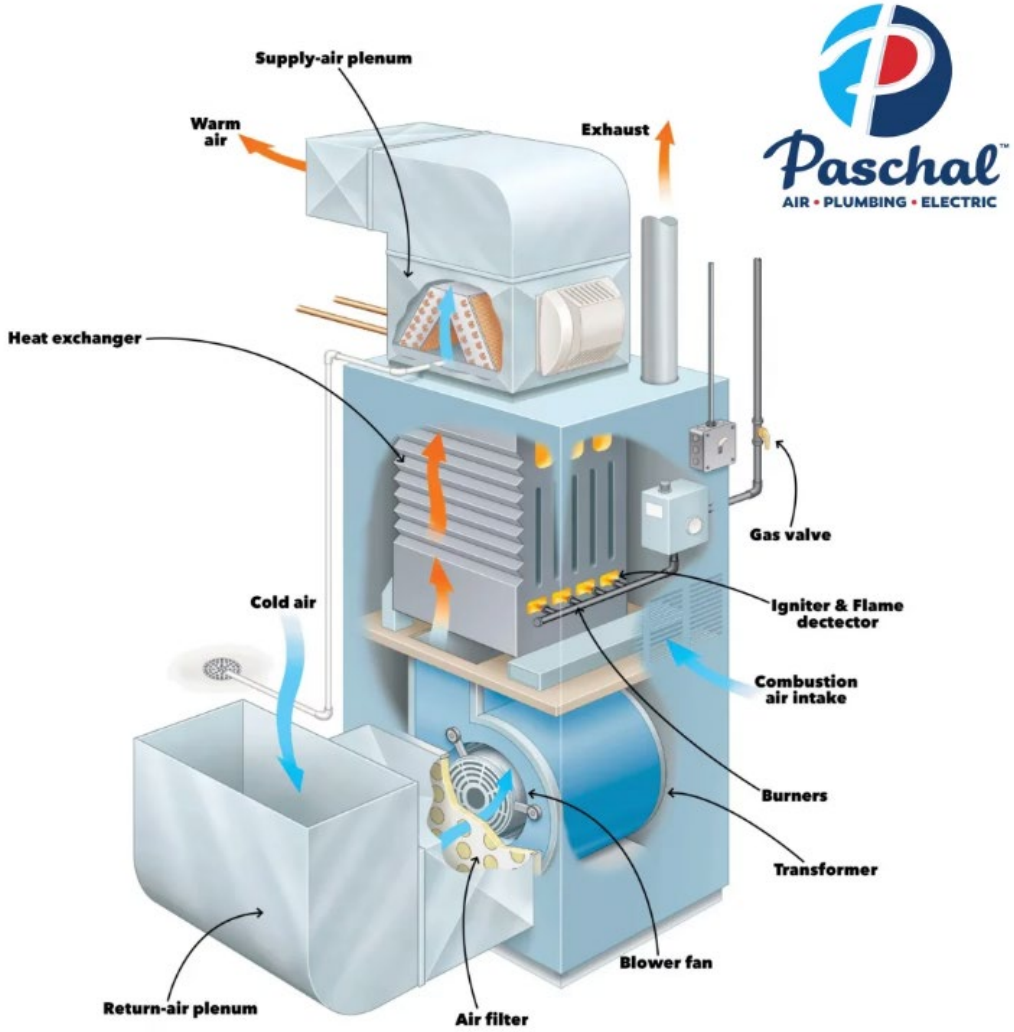
Definition of Hybrid (dual fuel) HVAC

- For this pilot, Hybrid HVAC is a dual fuel system where a ducted single-speed heat pump and programmable thermostat are added to an existing gas furnace.
- The pilot application is in single-family homes without air conditioning and with gas furnaces that are five years old on average.
  - Homes have been previously weatherized
  - Homes do not have deferred maintenance that would prohibit successful installation or operation of HVAC system
  - Homes do not need major duct repair
  - Homes do not need major electrical service upgrades such as a new panel or braker box

Example Hybrid Heat Pump System Configurations



Source: https://slipstreaminc.org/blog/dual-fuel-heat-pumps-beneficial-electrification



Source: https://gopaschal.com/space-heaters-vs-heat-pump-vs-gas-furnace-which-is-better-at-heating-a-room/

Research Objectives

Research Objective 1

Determine the utility system costs and benefits of hybrid HVAC system installations.

- Fuel use – gas and electric
- Load/demand – gas and electric
- Carbon intensity – gas, electric and overall

Research Objective 2

Determine the customer costs and benefits of hybrid HVAC system installations.

- Energy costs – gas, electric and overall
- Added cooling value
- Comfort and living conditions
- Backup auxiliary-fuel
- Maintenance and upkeep

Research Objective 3

Determine the costs and process considerations associated with installing Hybrid HVAC systems in low-income households.

- Other necessary infrastructure changes – electric panels, ducts, etc.
- Homes served and homes disqualified
- Geographic regions served well and those we had difficulty serving – customer base size, installation contractors, supply chain
- Cost of installations – Hybrid HVAC system, other infrastructure, Energy Trust costs
- Timeline for installations – customer recruitment to successful implementation and use

Research Methods Overview
Quantitative and Qualitative

Research Methods Overview

UCI Billing Analysis

- Fuel Use
- Customer Bills

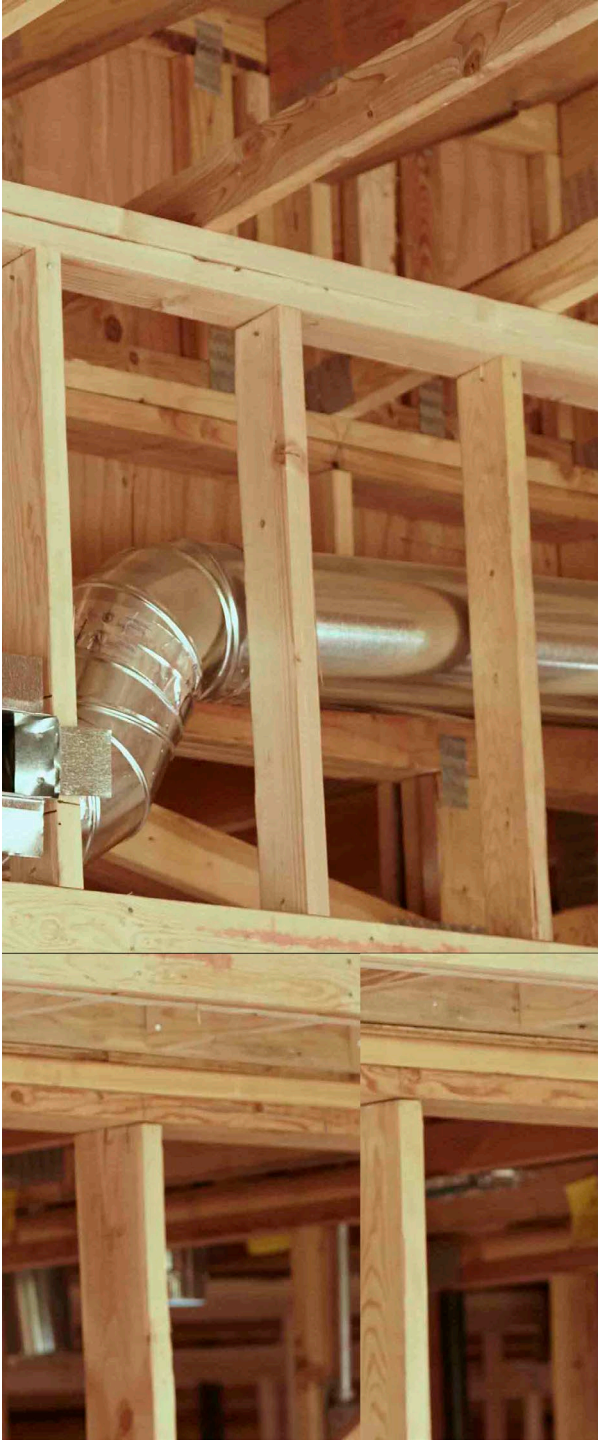
AMI and UCI Billing Analysis

- Demand patterns
- Carbon Intensity

Audit, Process, and Qualitative Data Collection

- Customer value associations
- Customer comfort
- Infrastructure
- Customer demographics
- Cost
- Time

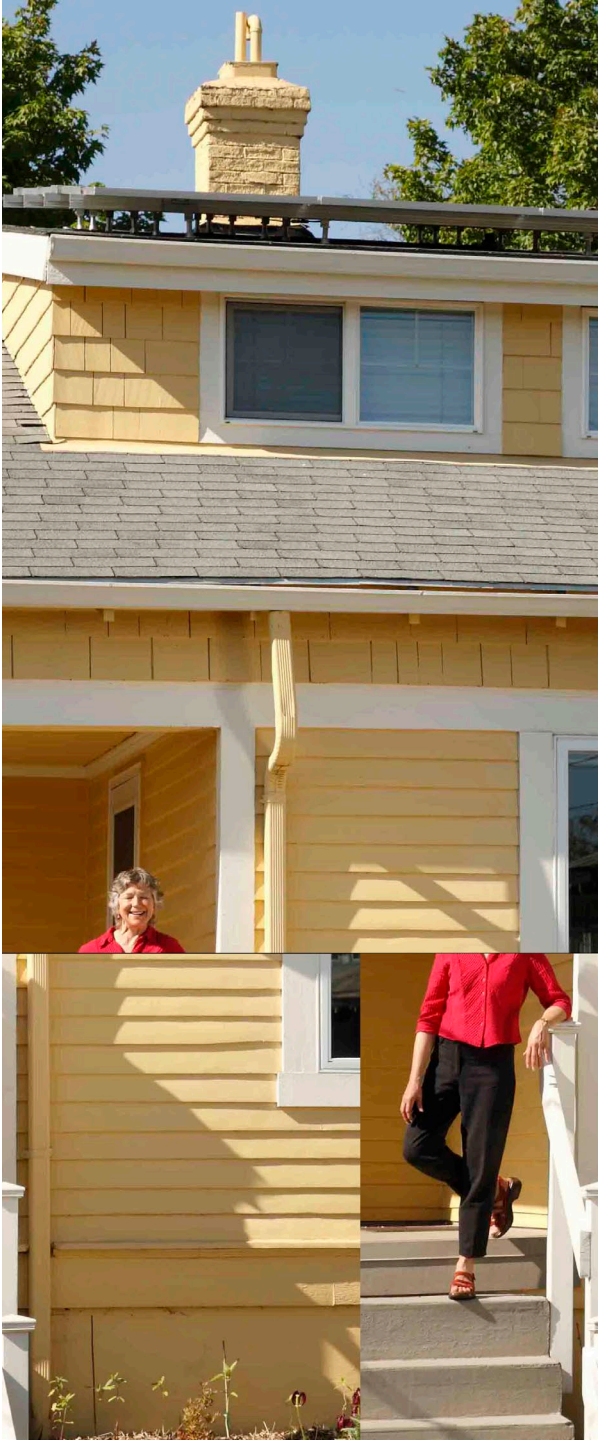
UCI (utility customer information); AMI (advanced metering infrastructure)



UCI Billing Analysis

- Weather normalized Utility Customer Information (UCI) monthly data from participant sites compared to two non-participant groups
- Non-participant groups include a gas and electric group with similar usage patterns to participant homes pre-pilot participation
- Data used for this method:

Research Element	Data Used
Fuel use	UCI data already provided to Energy Trust
Customer bills	UCI data already provided to Energy Trust, relevant low-income rate adjustments for each customer per utility



AMI & UCI Billing Analysis

- Continuing to use non-participant comparison groups
- Demand analyzed over winter period where the usage will be different than the control groups
- Carbon intensity measured over monthly and annual time scales, but only compared to non-participants during winter period

Research Element	Data Used
Electric demand	Winter electric AMI data
Gas demand	Winter gas UCI data
Carbon intensity	Power Council carbon values for gas and electric utilities; RTF load profiles; Winter electric AMI data and electric/gas monthly UCI data

Audit, Process and Qualitative Data Collection

- Collected during the process and one additional time roughly a year after the installation
- Customer engagement occurs once post installation by an evaluation contractor

Research Element	Data Used
Customer value associations	Collected during audit process and again during 1 post installation engagement
Customer comfort	Collected during 1 post installation engagement
Infrastructure improvement needs	Collected during audit and installation process
Customer demographics	Collected during referral and audit process
Cost considerations	Collected during referral, audit and installation process; maintenance over 1-year post-install
Time considerations	Collected during referral, audit and installation process

HHVAC Pilot Process To Date

HHVAC Pilot Status

- Energy Trust worked internally to scope a draft pilot proposal
- Utility coordination meetings on May 8th
- Feedback opportunity for utilities to provide question and concerns and suggestions
- Utility coordination meeting on May 19th
- Second feedback period
- Pilot draft proposal sent out to utility stakeholders on June 20th
- Third feedback opportunity
- CAC presentation on June 28th
- Final feedback opportunity
- Final pilot design ready for implementation ~ July 5th

Description of Pilot

Pilot Description

- Energy Trust to pay full cost of installs
- Income-qualified households, previously served by low-income weatherization services
- Homes must be weatherized and have a gas furnace no older than ~5 years, and no existing central AC
- House triage and customer education and support provided by Energy Trust staff
- Installation contractors selected through RFQ projects awarded on a rolling basis
- Post install QA provided by Energy Trust in every home

Heat Pump Specifications and Cost

- Heat pump size determined through Manual J, and cooling needs of the home (in alignment with ACCA2 Standard)

- Cross-over temperature
  - Energy Trust will leverage our installation Contractor RFQ to solicit more professional feedback on best practices
    - Goals - avoid customers experiencing no-heat conditions when heat pump switches to defrost mode
    - Follow manufacturer requirements depending on make/model
    - Stay within technical capabilities of equipment selection and controls

- Thermostat selection also to be explored through RFQ

- Cost range between $10,000 - $12,000 (not to exceed $13,000) per home

Customer Engagement & Support

Stage 1 – Phone Screening	Stage 2 – Virtual or In-Person Audit	Step 3 – Contractor site visit/bid creation	Step 4 – Contractor Installation	Step 5 – Ongoing Customer Support
• Income qualifications • Describe offer • Background on energy education/benefits of cooling • Risks around possible bill increases	• Performed by program team member • Verify thermal shell conditions • Assess existing gas furnace and ducts • Document electrical panel • Option: Connect with installer to collect data impacting bid	• Contractor visits home similar to traditional bid process • Checks to ensure project can be completed within CRP limitations	• Installer + electrician complete work at home • Program representative present on final day of installation to perform system QA & diagnostic testing. Also will provide customer education information	• Provide customer phone and email communication information for accessing Energy Trust • Complete post-installation survey(s) to verify satisfaction with system

Timeline and Budget

High Level Project Timeline

May 2023– June 2023

- Implementation planning
- Stakeholder engagement
- Measure development
- Installer recruitment

July 2023 – September 2023

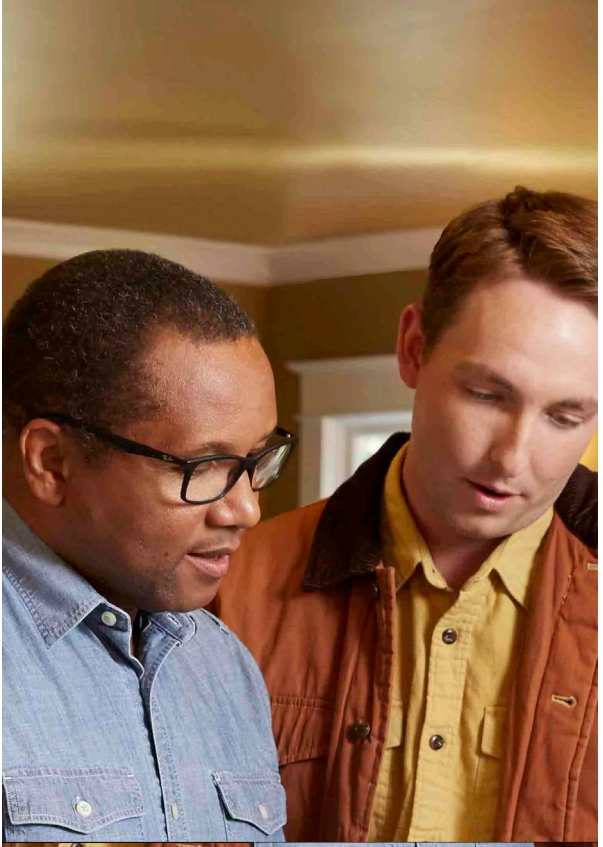
- Customer recruitment
- Site eligibility verification

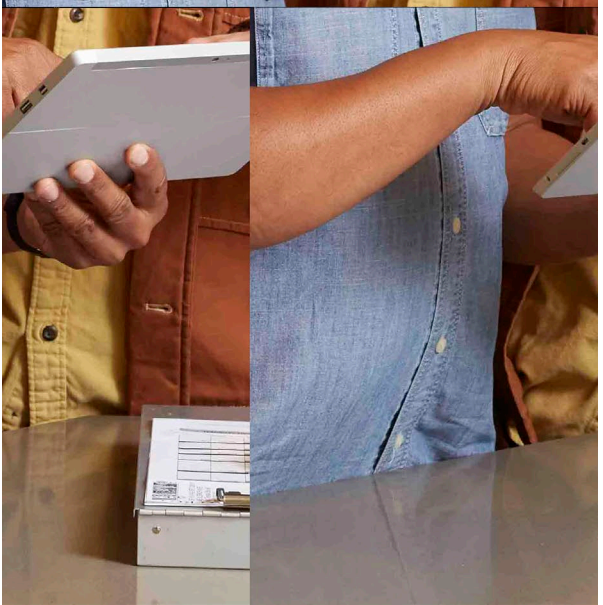
August 2023- July 2024

- Installations & site treatment
- Post-install verification & QA

July 2025– December 2025?

- Project Evaluation





Budget

Utility	Units	Initial Assumption	Proposed Budget
Pacific Power	20	$240,000	$320,000
PGE	20	$240,000	$320,000
NW Natural	26	$312,000	$405,000
Avista	12	$144,000	$190,000
Cascade Natural Gas	12	$144,000	$190,000
	90	$1,080,000	$1,425,000

- Initial assumption applied funding in both 2023 and 2024
- Some budget was included in the 2023 approved budget
- Plan to leverage reserve utility funding to align actual budget expenditures

Geographic Assumptions

- Prioritize overlapping gas and electric territories
- Concentrate efforts regionally to maximize delivery resources
- Leverage utility insights to support customer acquisition

Gas	Electric	Quantity	Geography
NWN	PGE	50	Portland Metro
AVI	PAC	20	S. Oregon / Klamath
CNG	PAC	20	Central / Eastern

Next Steps

- Ongoing Energy Trust / utility meetings as needed
  - Address outstanding objections or concerns
  - Further discuss utility support of data needs
  - Scope customer solicitation lists and next steps
- Energy Trust to set up CBO, low-income advocacy and Community Action Agency outreach and engagement to inform partners of the proposed pilot

Thank You

Energy Trust Pilot Team -

Tracy Scott, Steve Lacey, Thad Roth, Marshall Johnson, Andrew Shepard, Jackie Goss, Cody Kleinsmith, Julianne Thacher, Alex Novie

EnergyTrust of Oregon

Utility Customer Arrearage Analysis
Methodological Change & Updates
June 28, 2023

Energy Trust of Oregon

Agenda

- Cost-effectiveness 101
- Non-energy benefits exploration: Utility customer arrearage reduction
  - Methodological framework
- Updated analysis results
- Conclusions
- Questions

Cost Effectiveness 101

- Cost effectiveness is central to how Energy Trust plans and delivers energy efficiency programs
  - Informs which measures Energy Trust offers incentives for and **places an upper bound on the incentive amount**, except where the OPUC provides exceptions

- **Measure** and **program cost effectiveness** is required in Oregon under PUC rule UM-551 to ensure that Energy Trust is making good investments for utility customers. UM-551 establishes:
  - Which cost-effectiveness tests to use
  - How to calculate benefits and costs
  - What criteria is allowed to request exceptions to cost-effectiveness

- Aligns with utility long-term integrated resource planning (IRP)
  - Efficiency is a *resource* used to meet energy needs at least overall cost
  - Efficiency costs are compared to supply resources
  - Cost-effectiveness tests are a simple way to determine whether investments in efficiency and compare with other supply side resources

Two Tests, Two Perspectives

Total Resource Cost Test (TRC):

- Determines measure and program eligibility for inclusion in programs
- Reflects the combined perspectives of participant and utility
- Includes all benefits and all costs to utility system and to participants
- Program and administrative costs are not included for measure analysis, but are for analyzing programs

$$TRC = \frac{NPV\ ((Savings \times Avoided\ cost) + Non\text{-}energy\ benefits)}{NPV\ (Incremental\ measure\ cost)}$$

Utility Cost Test (UCT):

- Primarily used to determine maximum incentives (sometimes limits eligibility)
- Benefits to the utility system and costs to the program administrator
- Program and administrative costs are not included for measure analysis

$$UCT = \frac{NPV\ (Savings \times Avoided\ cost)}{NPV\ (Incentives\ Paid)}$$

Quantifying the Theoretical Value of Arrearages Reductions as a Non-energy Benefit

- Utilities incur additional costs when customers are unable to pay their bills

Opportunity Costs

Programmatic Costs

- Data from January 2020 – February 2023 show on average there have been about 246,000 residential customers in arrears with an average arrearage of $248/customer.

This is a non-energy benefit (NEB) for a utility:

A rare case where NEBs directly reduce utility costs, so are applied to the numerator of the Utility Cost Test

Reduced Arrearage Carrying Cost (RACC)

Opportunity Costs

The opportunity cost of carrying customer debt by the utility

$$RACC = Bill\ Reduction * Arrearage\ Impact * Interest\ Rate$$

Input	Source	Value
Electric Savings (kWh)	*Measure Specific*	*Measure Specific*
Gas Savings (Therms)	*Measure Specific*	*Measure Specific*
Blended ELE Utility Rate ($/kWh)	*Energy Trust Common Assumptions Workbook*	*$ 0.12*
Blended Gas Utility Rate ($/Therm)	*Energy Trust Common Assumptions Workbook*	*$ 1.22*
Arrearage Impact	APPRISE. (2021). California Energy Savings Assistance Program Non-Energy Benefits Final Report.	32%
Interest Rate	Energy Trust Blended Discount Rate	4.50%

Reduced Arrearage Expenditures (RAE)

Programmatic Costs

The reduction in operational expenditures for the utility managing arrearages including but not limited to:

- **Bad debt write-off**
- Bill collection notices & calls
- Disconnects & reconnects
- Low-income subsidies and payments

$$RAE = Bill\ Reduction * Arrearage\ Impact * \%\ Arrears\ Written\ Off$$

Input	Source	Value
Electric Savings (kWh)	*Measure Specific*	*Measure Specific*
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Arrearage Impact	APPRISE. (2021). California Energy Savings Assistance Program Non-Energy Benefits Final Report.	32%
% Arrears Written Off	Averaged percentage from primary literature. (*APPRISE and ITRON studies*)	21%

Outcomes of Applying Arrearage NEBs

- Increases maximum incentive on certain measures for certain households, but most are already constrained by incremental costs
- Small relative to remaining costs potential arrearage customers would still need to invest for efficiency measures

	Before NEB			With Arrearage NEB			Total Cost	Remaining Customer Cost
	Incremental Cost	Maximum Incentive ($)	UCT BCR at Max Incentive	Arrearage NEB (Annual $)	Maximum Incentive ($)	Max Incentive Increase		
Single Family DHP	$ 4,185.00	$ 3,377.42	1.00	**$ 22.67**	$ 3,542.21	$ 164.79	$ 4,462.00	$ 919.79
Manufactured Home DHP	$ 3,775.00	$ 3,775.00	1.57	**$ 39.77**	$ 3,775.00	$ -	$ 4,086.00	$ 311.00
NEEM+ Single Wide	$ 89,078.00	$ 26,577.11	1.00	**$ 134.85**	$ 28,484.92	$ 1,907.81	$ 89,078.00	$ 60,593.08
NEEM+ Double Wide	$ 125,939.00	$ 46,581.49	1.00	**$ 236.35**	$ 49,925.30	$ 3,343.81	$ 125,939.00	$ 76,013.70
Wall Insulation (1000 sqft)	$ 2,780.00	$ 2,780.00	1.29	**$ 9.39**	$ 2,780.00	$ -	$ 3,180.00	$ 400.00
Floor Insulation (1000 sqft)	$ 2,010.00	$ 761.33	1.00	**$ 3.86**	$ 815.98	$ 54.65	$ 2,030.00	$ 1,214.02
Attic Insulation (1000 sqft)	$ 1,530.00	$ 1,530.00	4.14	**$ 15.15**	$ 1,530.00	$ -	$ 1,780.00	$ 250.00
Tankless Water Heater	$ 546.00	$ 546.00	2.28	**$ 6.77**	$ 546.00	$ -	$ 3,050.00	$ 2,504.00
HPWH	$ 968.21	$ 968.21	1.15	**$ 13.88**	$ 968.21	$ -	$ 2,840.00	$ 1,871.79
90%+ AFUE Gas Furnace	$ 1,415.00	$ 1,415.00	1.77	**$ 8.94**	$ 1,415.00	$ -	$ 5,336.00	$ 3,921.00

**Assumes arrearages remain for half the measure life of the respective measures.*

Conclusions

- Arrearage NEBs continue to have limited impact on raising incentives not already constrained by incremental costs.
  - Will require significant work from both OPUC staff and Energy Trust to coordinate with utilities to pursue data required to appropriately quantify this NEB.
  - Increasing avoided costs will likely push maximum incentives for remaining measures up against incremental cost

- OPUC & Energy Trust agree that other approaches have more impactful potential to address the needs of these customers
  - Exceptions process to provide incentives for specific customer groups
  - Expecting avoided costs to increase on the electric side
  - Energy Trust is working to quantify health benefits
  - OPUC staff is examining various strategies to further support acceleration of energy efficiency
  - HB 2475 provides another framework for Energy Trust to serve low-income customers

Questions?

Thank You

Jake Kennedy
jake.kennedy@energytrust.org
Planning Project Manager

EnergyTrust of Oregon

Hybrid (Dual fuel) Heat Pump Pilot

Conservation Advisory Council

June 28, 2023

Energy Trust of Oregon

Agenda

- Energy Trust pilots
- What is Hybrid (dual fuel) HVAC (HHVAC)
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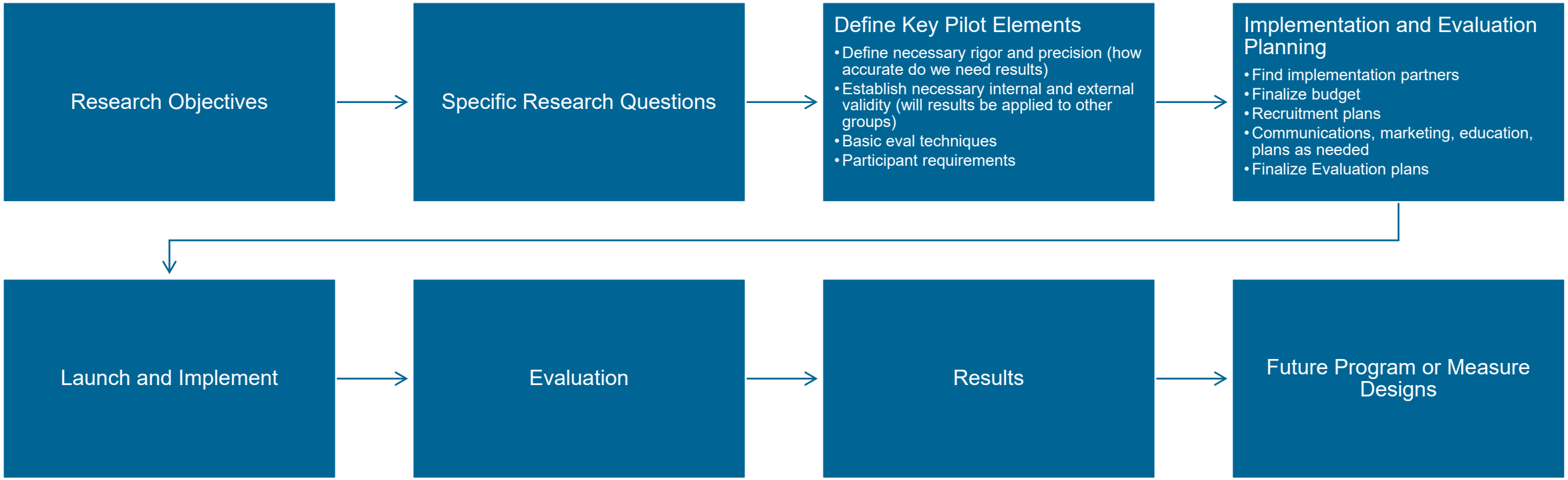

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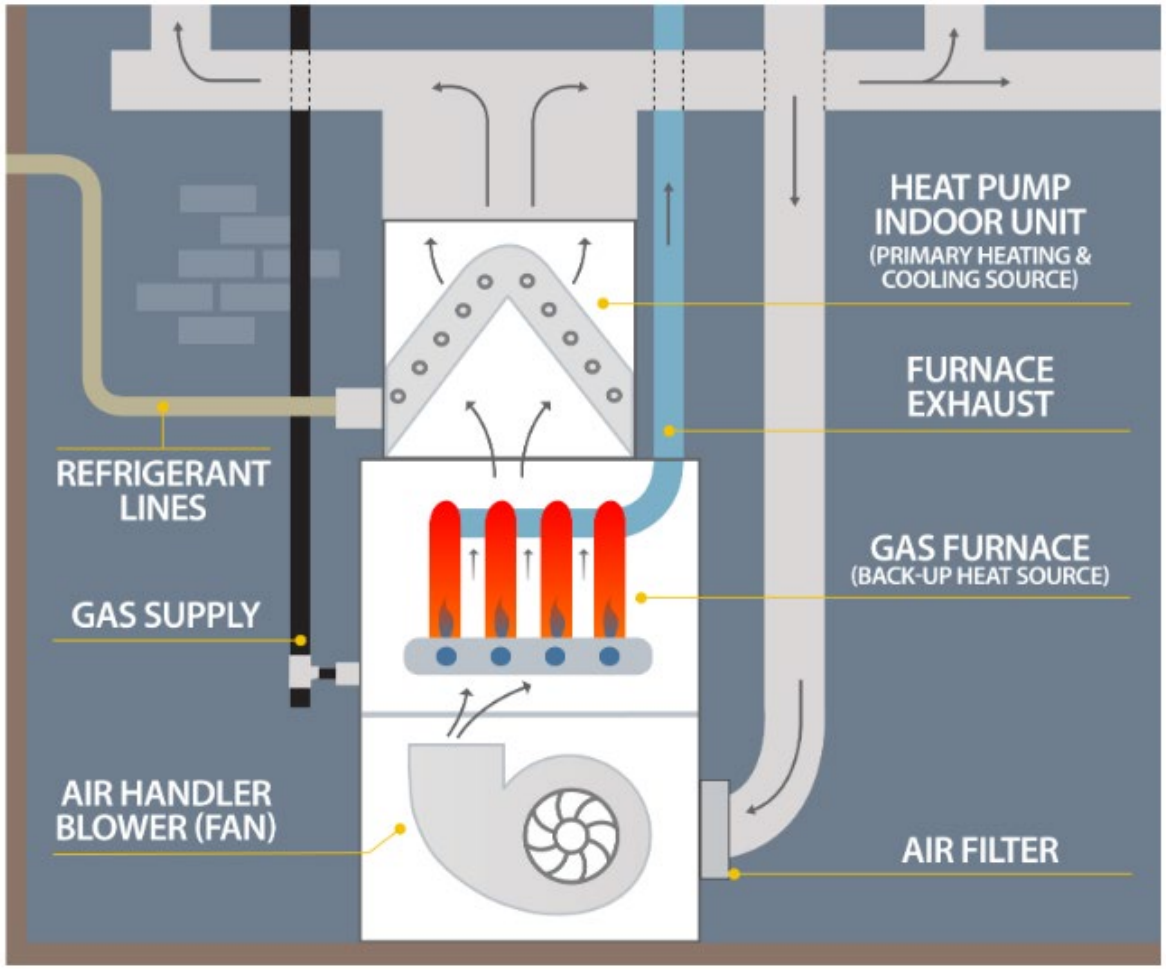
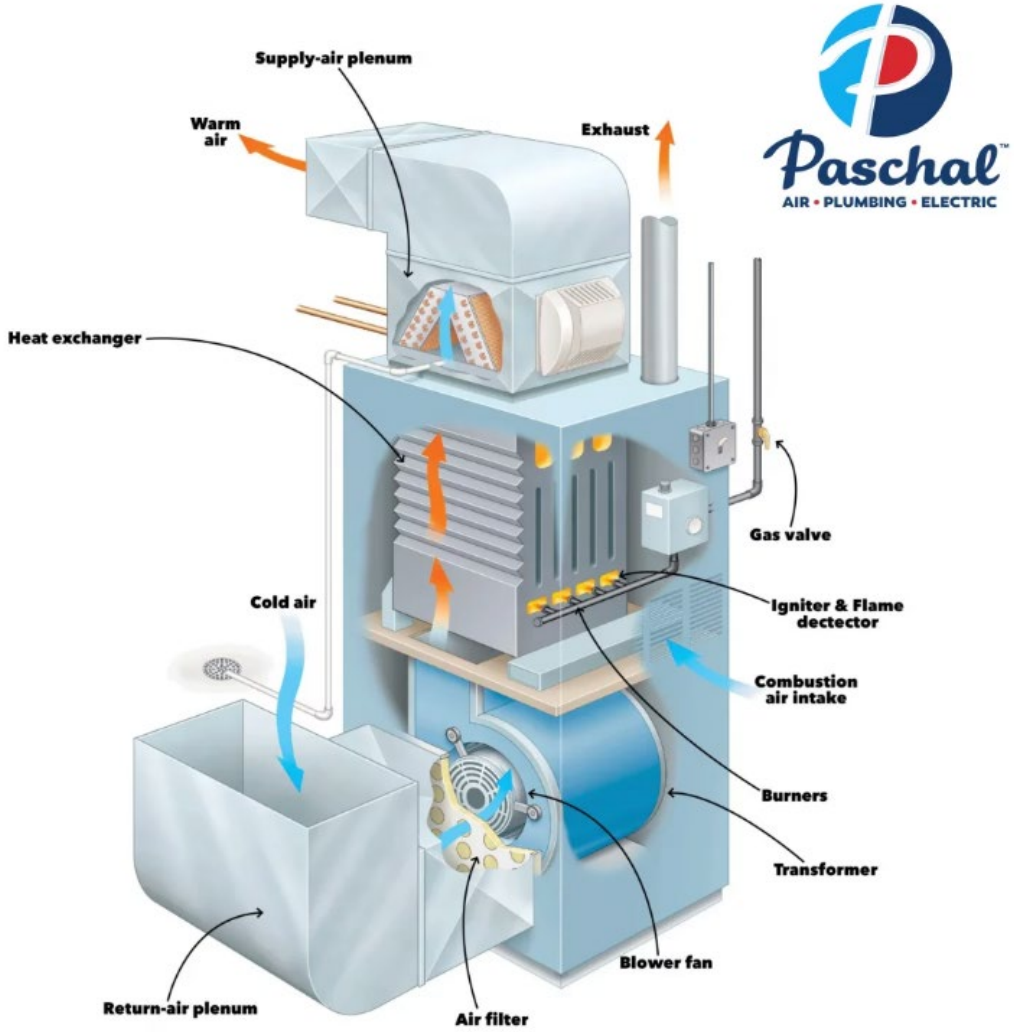
  - Homes do not need major electrical service upgrades such as a new panel or braker box

Example Hybrid Heat Pump System Configurations



Source: https://slipstreaminc.org/blog/dual-fuel-heat-pumps-beneficial-electrification



Source: https://gopaschal.com/space-heaters-vs-heat-pump-vs-gas-furnace-which-is-better-at-heating-a-room/

Research Objectives

Research Objective 1

Determine the utility system costs and benefits of hybrid HVAC system installations.

- Fuel use – gas and electric
- Load/demand – gas and electric
- Carbon intensity – gas, electric and overall

Research Objective 2

Determine the customer costs and benefits of hybrid HVAC system installations.

- Energy costs – gas, electric and overall
- Added cooling value
- Comfort and living conditions
- Backup auxiliary-fuel
- Maintenance and upkeep

Research Objective 3

Determine the costs and process considerations associated with installing Hybrid HVAC systems in low-income households.

- Other necessary infrastructure changes – electric panels, ducts, etc.
- Homes served and homes disqualified
- Geographic regions served well and those we had difficulty serving – customer base size, installation contractors, supply chain
- Cost of installations – Hybrid HVAC system, other infrastructure, Energy Trust costs
- Timeline for installations – customer recruitment to successful implementation and use

Research Methods Overview
Quantitative and Qualitative

Research Methods Overview

UCI Billing Analysis

- Fuel Use
- Customer Bills

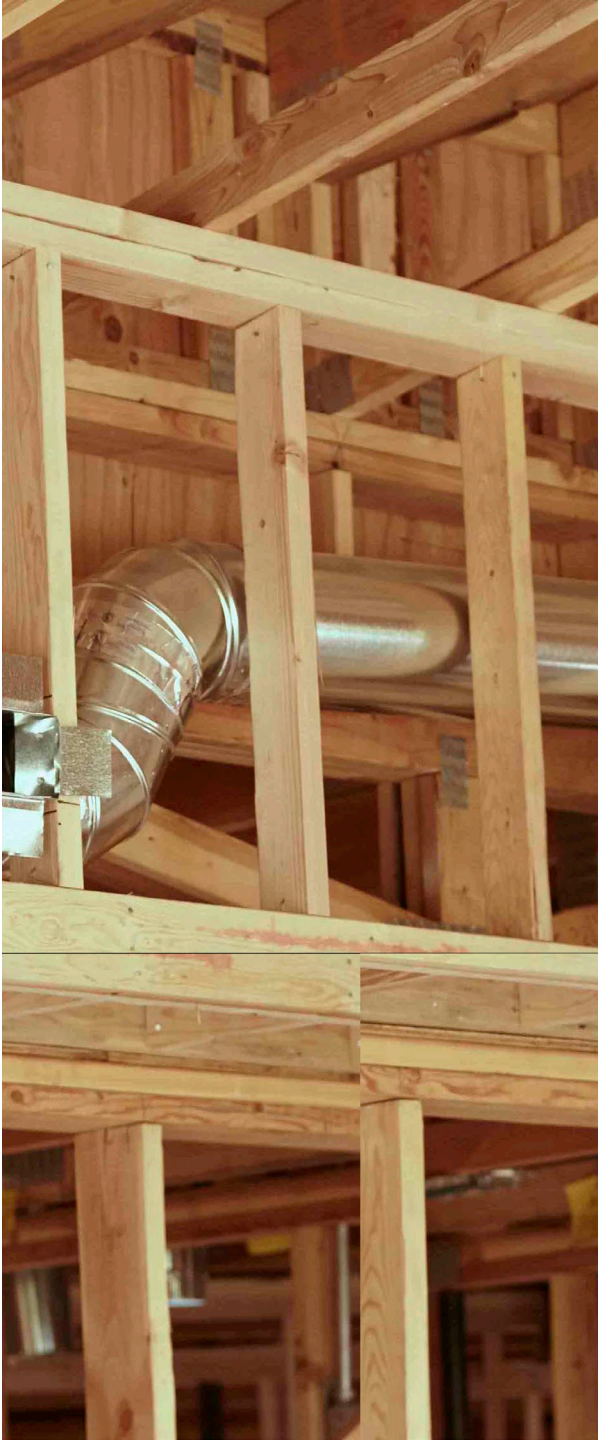
AMI and UCI Billing Analysis

- Demand patterns
- Carbon Intensity

Audit, Process, and Qualitative Data Collection

- Customer value associations
- Customer comfort
- Infrastructure
- Customer demographics
- Cost
- Time

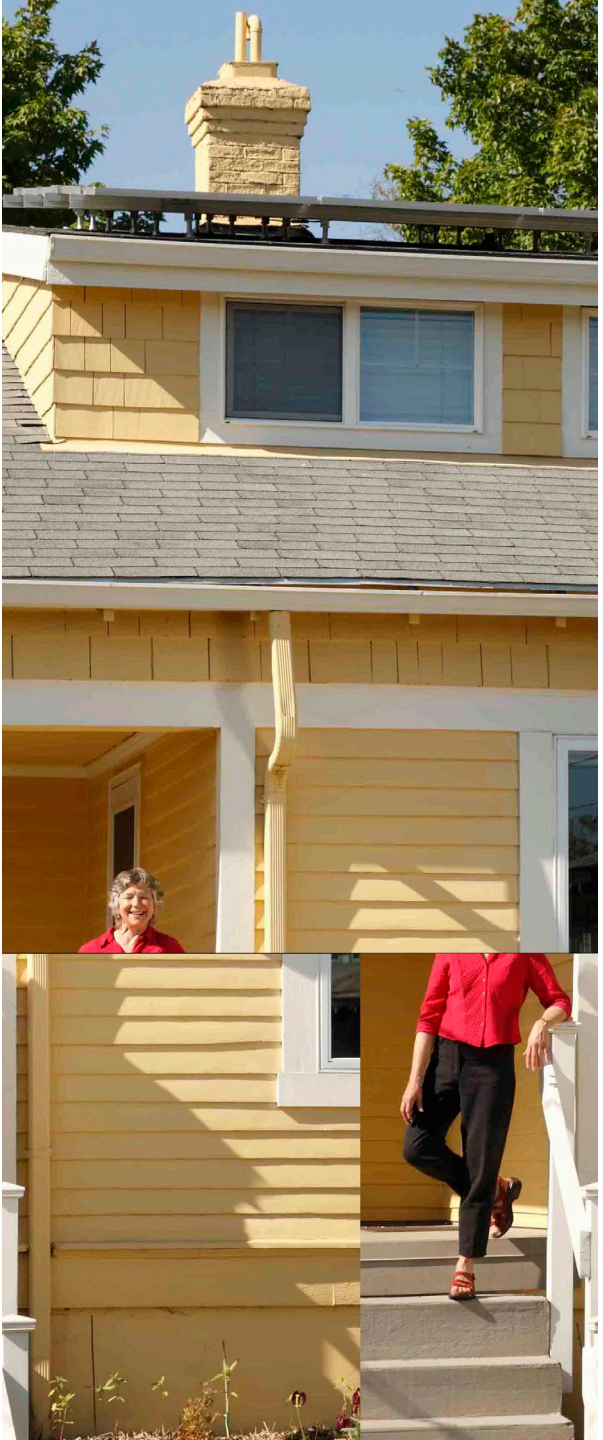
UCI (utility customer information); AMI (advanced metering infrastructure)



UCI Billing Analysis

- Weather normalized Utility Customer Information (UCI) monthly data from participant sites compared to two non-participant groups
- Non-participant groups include a gas and electric group with similar usage patterns to participant homes pre-pilot participation
- Data used for this method:

Research Element	Data Used
Fuel use	UCI data already provided to Energy Trust
Customer bills	UCI data already provided to Energy Trust, relevant low-income rate adjustments for each customer per utility



AMI & UCI Billing Analysis

- Continuing to use non-participant comparison groups
- Demand analyzed over winter period where the usage will be different than the control groups
- Carbon intensity measured over monthly and annual time scales, but only compared to non-participants during winter period

Research Element	Data Used
Electric demand	Winter electric AMI data
Gas demand	Winter gas UCI data
Carbon intensity	Power Council carbon values for gas and electric utilities; RTF load profiles; Winter electric AMI data and electric/gas monthly UCI data

Audit, Process and Qualitative Data Collection

- Collected during the process and one additional time roughly a year after the installation
- Customer engagement occurs once post installation by an evaluation contractor

Research Element	Data Used
Customer value associations	Collected during audit process and again during 1 post installation engagement
Customer comfort	Collected during 1 post installation engagement
Infrastructure improvement needs	Collected during audit and installation process
Customer demographics	Collected during referral and audit process
Cost considerations	Collected during referral, audit and installation process; maintenance over 1-year post-install
Time considerations	Collected during referral, audit and installation process

HHVAC Pilot Process To Date

HHVAC Pilot Status

- Opportunity identified during Energy Trust 2024 budgeting process in fall 2022
- Energy Trust worked internally to scope a draft pilot proposal
- Utility and Energy Trust planning meetings in Q1 2023
- Utility coordination and development meetings in May and June
- CAC presentation and feedback on June 28
- Final pilot design ready for implementation ~ July 5

Description of Pilot

Pilot Description

- Energy Trust to pay full cost of installs
- Income-qualified households, previously served by low-income weatherization services
- Homes must be weatherized and have a gas furnace no older than ~5 years, and no existing central AC
- House triage and customer education and support provided by Energy Trust staff
- Installation contractors selected through RFQ projects awarded on a rolling basis
- Post install QA provided by Energy Trust in every home

Heat Pump Specifications and Cost

- Heat pump size determined through Manual J, and cooling needs of the home (in alignment with ACCA2 Standard)

- Cross-over temperature
  - Energy Trust will leverage our installation Contractor RFQ to solicit more professional feedback on best practices
    - Goals - avoid customers experiencing no-heat conditions when heat pump switches to defrost mode
    - Follow manufacturer requirements depending on make/model
    - Stay within technical capabilities of equipment selection and controls

- Thermostat selection also to be explored through RFQ

- Cost range between $10,000 - $12,000 (not to exceed $13,000) per home

Customer Engagement & Support

Stage 1 – Phone Screening	Stage 2 – Virtual or In-Person Audit	Step 3 – Contractor site visit/bid creation	Step 4 – Contractor Installation	Step 5 – Ongoing Customer Support
• Income qualifications • Describe offer • Background on energy education/benefits of cooling • Risks around possible bill increases	• Performed by program team member • Verify thermal shell conditions • Assess existing gas furnace and ducts • Document electrical panel • Option: Connect with installer to collect data impacting bid	• Contractor visits home similar to traditional bid process • Checks to ensure project can be completed within CRP limitations	• Installer + electrician complete work at home • Program representative present on final day of installation to perform system QA & diagnostic testing. Also will provide customer education information	• Provide customer phone and email communication information for accessing Energy Trust • Complete post-installation survey(s) to verify satisfaction with system

Timeline and Budget

High Level Project Timeline

May 2023– June 2023

- Implementation planning
- Stakeholder engagement
- Measure development
- Installer recruitment

July 2023 – September 2023

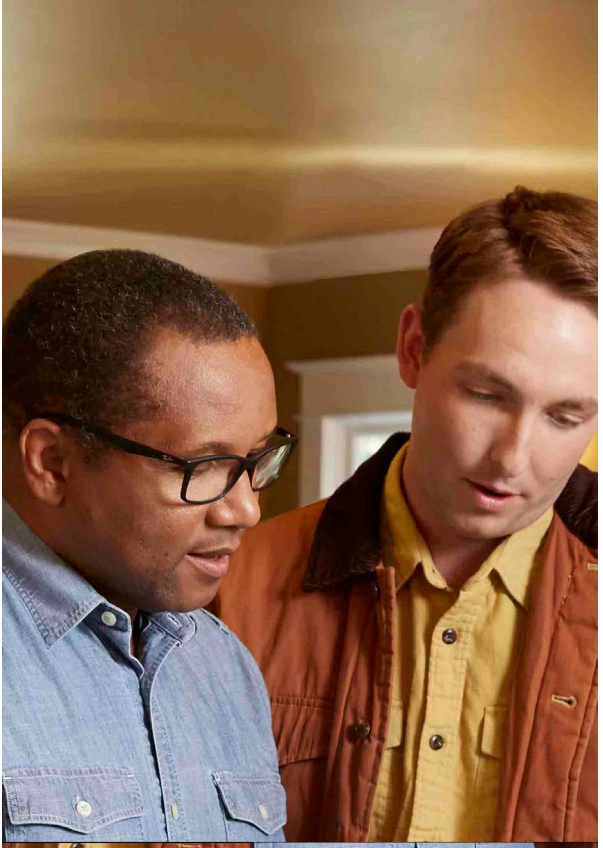
- Customer recruitment
- Site eligibility verification

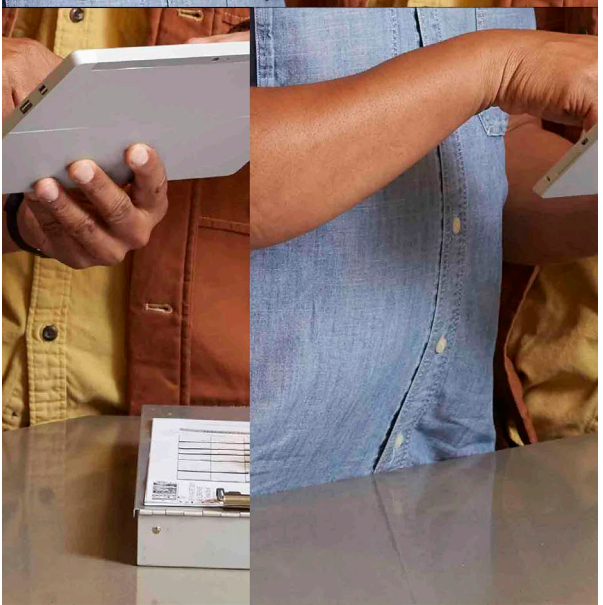
August 2023- July 2024

- Installations & site treatment
- Post-install verification & QA

July 2025– December 2025?

- Project Evaluation





Budget

Utility	Units	Initial Assumption	Proposed Budget
Pacific Power	20	$240,000	$320,000
PGE	20	$240,000	$320,000
NW Natural	26	$312,000	$405,000
Avista	12	$144,000	$190,000
Cascade Natural Gas	12	$144,000	$190,000
	90	$1,080,000	$1,425,000

- Initial assumption applied funding in both 2023 and 2024
- Some budget was included in the 2023 approved budget
- Plan to leverage reserve utility funding to align actual budget expenditures

Geographic Assumptions

- Prioritize overlapping gas and electric territories
- Concentrate efforts regionally to maximize delivery resources
- Leverage utility insights to support customer acquisition

Gas	Electric	Quantity	Geography
NWN	PGE	50	Portland Metro
AVI	PAC	20	S. Oregon / Klamath
CNG	PAC	20	Central / Eastern

Next Steps

- Ongoing Energy Trust / utility meetings as needed
  - Address outstanding objections or concerns
  - Further discuss utility support of data needs
  - Scope customer solicitation lists and next steps
- Energy Trust to set up CBO, low-income advocacy and Community Action Agency outreach and engagement to inform partners of the proposed pilot

Thank You

Energy Trust Pilot Team -

Tracy Scott, Steve Lacey, Thad Roth, Marshall Johnson, Andrew Shepard, Jackie Goss, Cody Kleinsmith, Julianne Thacher, Alex Novie

EnergyTrust of Oregon