2022 Annual Report to the Oregon Public Utility Commission & Energy Trust Board of Directors

ENERGY TRUST OF OREGON
APRIL 14, 2023

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From the executive director

Utility customers looking to take on energy-saving projects – and the tradespeople working to complete them – encountered plenty of challenges in 2022. Many of these stretch all the way back to the start of the pandemic. Supply chain disruptions that simmered for years reached critical mass, leading to lengthy project delays and price increases that threatened project affordability. Labor shortages – compounded by years of high demand and lasting impacts of public health restrictions in 2020 – stretched the capacity of many of our trade ally contractors. Inflation and lingering economic uncertainty led some customers to delay or cancel projects. These difficult conditions are reflected in our annual results: In 2022, we fell short of our energy efficiency goals while accomplishing other goals related to generating renewable energy, expanding community-led approaches, developing capabilities to expand funding and implementing new work strategies to adapt, support staff and manage operating costs.

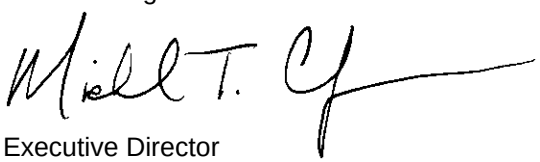
As stewards of ratepayer funding, transparency and accountability are at the heart of what we do. Thanks to improvements in our forecasting processes, we had a clear picture early in the year of the degree to which market conditions would impact our energy savings results for 2022, and we worked with stakeholders to communicate these challenges, manage risks and make progress where possible. Looking ahead to 2023, more conservative energy savings goals balance the long-term achievable potential we have identified with these challenging market conditions. Program financial reserves will enable us to pursue and capture more savings in 2023 if conditions improve faster than anticipated.

Within this report are examples of our work with communities to help them accomplish their objectives for safety, sustainability and resiliency. That includes helping fire-ravaged communities come back from devastation strong and ready for the future and providing comfort and access to cooling for customers experiencing extreme heat. While clean, affordable energy solutions may not be the most obvious need in cases like these, they can be life changing. For instance, after a sudden and devastating hailstorm struck Wallowa in Eastern Oregon – damaging nearly 300 homes in a town of 800 people, with many of the properties uninsured – we worked with our partners to expand access to our cash incentives for home projects and help connect residents to resources. This is just one case where we're designing programs and services that help customers find a new way forward.

As we help prepare customers and communities for the future, we're also making changes internally to help us respond to the evolving energy landscape in ways that produce more benefits for customers. In 2022, that included the creation of our Innovation and Development team to pursue external funding opportunities while supporting evolution in our programs and services, all with the goal of helping us serve more customers in new and more meaningful ways. One source of additional funding for our customers is the recent Inflation Reduction Act, the largest ever federal investment in climate that could bring transformational changes to our work while helping millions benefit from clean energy. Energy Trust is well positioned to help Oregonians leverage these new resources while accelerating energy efficiency and renewable energy efforts within our state beyond what was previously possible. Lastly, we're excited to see lawmakers and the Oregon Public Utility Commission supporting our ongoing commitment to ensure everyone equitably benefits from climate actions. New equity metrics set by the OPUC for Energy Trust starting in 2023 make equity a formal part of its oversight and our accountability to customers.

Thank you to all who helped us in 2022, including our customers, the OPUC, Portland General Electric, Pacific Power, NW Natural, Cascade Natural Gas, Avista, Northwest Energy Efficiency Alliance, Oregon Department of Energy, Oregon Housing and Community Services, trade ally contractors, cities, counties and community organizations.

Michael Colgrove



Executive Director

I Executive summary

A. Progress to 2022 goals[1,2,3]

GOAL 1: Achieve savings and renewable generation goals while addressing the needs of customers who experience significant energy burden or are impacted by disaster events.

OUTCOME: MIXED ACROSS THE PORTFOLIO

- Energy Trust fell short of its electric and natural gas savings goals amid challenging market conditions including supply chain disruptions, labor shortages, price increases and general economic uncertainty.
    - Electric efficiency improvements completed in 2022 **saved 46.8 average megawatts of electricity**, about 8% less than the 2022 goal of 50.6 aMW, at a levelized cost[4] of 3.1 cents per kilowatt hour.
    - Natural gas efficiency improvements completed in 2022 **saved 5.9 million therms of natural gas**, about 18% less than the 2022 goal of 7.3 million therms, at a levelized cost of 49.5 cents per therm.
- Energy Trust met goal in Portland General Electric service area and fell short of goals in Pacific Power, NW Natural, Cascade Natural Gas and Avista service areas. It also fell short of energy savings performance measures set by the OPUC in Pacific Power, Cascade Natural Gas and Avista service areas. For more information on performance measures, see Section IV.
- Energy Trust exceeded its renewable energy generation goal, largely due to continued high demand for residential solar and the increasing efficiency of solar panels. Total renewable energy systems installed in 2022 will **generate 5.93 aMW** of **electricity**, 45% more than the 2022 goal of 4.1 aMW. For more information, see page 14.
    - This was the first year of new requirements for Energy Trust to invest at least 25% of ratepayer funds collected for renewable energy in activities and projects that benefit customers with low or moderate incomes. In 2022, Energy Trust **spent 29% on projects and activities to benefit customers with low or moderate incomes**, including $3.6 million on Solar Within Reach incentives for more than 500 income-qualified homeowners and a $53,000 incentive for a community solar project fully dedicated for low-income subscribers.
- This was also the first year Energy Trust set peak electric savings goals for summer and winter, a reflection of the increasing value of energy efficiency at certain days and times when utility system capacity is most constrained. Energy Trust met the winter peak savings goal and came very close to meeting the summer peak goal. For more information, see Appendix 9.

[1] Energy Trust reports gross savings as determined in consultation with OPUC and stakeholders in 2019. Previous reports included net savings, which are adjusted gross savings based on results of current and past evaluations.
[2] This report includes the best available energy savings data as of the date of submission. Energy savings for periods prior to January 1, 2021, may be different than previously reported as a result of applying updated evaluation factors to Energy Trust savings and generation in Oregon through the annual true up process. Previous true up reports are available online at energytrust.org/reports.
[3] Successful attainment of goals is defined as achieving at least 95% of the annual goal, per agreement with OPUC staff.
[4] Levelized cost is Energy Trust's total cost to save or generate each unit of energy over the life of the measure (which ranges from one to 20 years or more).

- Savings and generation achieved in 2022 represent **238,000 metric tons[5] of carbon dioxide** kept out of the atmosphere, the equivalent of removing 56,000 cars from Oregon roads for a year.
- In 2022, Energy Trust **began offering higher incentives for construction of new residential and commercial buildings following the Labor Day 2020 wildfires** and supported more than 100 residential new construction projects and 11 commercial projects with early design and technical assistance. Staff coordinated the rollout of these incentives with Oregon's Building Codes Division and Department of Energy, which are also supporting wildfire rebuilding.
- Energy Trust completed transition of its manufactured home replacement offer from pilot to permanent offer and conducted outreach to customers and stakeholders, including other groups and agencies offering funding for manufactured home replacements. In its first year, the offer replaced nine outdated manufactured homes with new, energy-efficient models.
- Energy Trust **launched the Landlord Provided Cooling Space Initiative to provide vulnerable residents with heat relief**. Funded through a contract with Oregon Department of Energy, the initiative provides incentives for landlords to create cooling spaces for multifamily residents. For more information, see Appendix 1.
- Energy Trust supported customers in the City of Wallowa in Northeastern Oregon following a devastating hailstorm that caused extensive property damage. Wallowa's population is on average older with lower median incomes and limited access to services available in larger communities. To aid recovery efforts, Energy Trust expanded access to residential incentives to all Pacific Power customers in Wallowa, regardless of their primary heating fuel, and made it easier to participate.

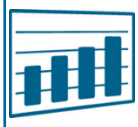
GOAL 2: Expand support for community-led approaches to increase access to clean energy.

OUTCOME: ACHIEVED

- Energy Trust **provided $205,000 in Working Together Grants to 21 nonprofit organizations** for activities conducted or proposed in 2022 that promote awareness and participation in Energy Trust programs. Grantees in the first round reached more than 9,000 customers through weatherization workshops, direct marketing, summer camps and other engagements.
- In 2022, Energy Trust enrolled four new community-based organizations – Polk Community Development Corporation, Rogue Climate, Sustainable Living Center (Walla Walla) and Washington and Yamhill Community Action Partnership – in its Community Partner Funding offer. The offer delivers the **highest incentive amounts possible for customers in rural areas and customers with low incomes**, including people of color. There are now 16 active community partners working with Energy Trust. Combined, they delivered $915,700 in incentives in 2022, a 56% percent increase compared with 2021.
- Energy Trust is supporting Solar Ambassadors, a collaborative effort with Portland-area community-based organizations to reduce barriers to solar energy for people of color. For more information, see Appendix 1.

[5] Carbon dioxide avoided is reported in metric tons in this report. In previous reports, carbon was reported in short tons.

- Energy Trust sponsored two conferences held by Rural Development Initiatives and Sustainable Northwest in Eastern Oregon to build awareness of its programs and services with rural communities and connect with communities undertaking clean energy projects.
- Energy Trust **formed a Tribal Working Group** with representatives from the Klamath and Modoc tribes, the Confederated Tribes of Umatilla Indian Reservation, Confederated Tribes of Warm Springs and Confederated Tribes of Grand Ronde. They provide input on how Energy Trust can shape programs to provide greater benefits specific to tribal needs with the goal of increasing participation.
- Energy Trust helped Wallowa Resources engage community leaders to facilitate and develop a Community Energy Strategic Plan for Wallowa County. The plan will include regional energy goals and strategies and identify and prioritize actions to save residents money, create local jobs and increase energy resilience.
- Energy Trust provided project development assistance to the City of Bend and Clatsop County to explore the viability of food waste recovery options and biogas production and committed assistance to the City of Gresham and the City of Roseburg to study renewable energy project feasibility.
- Energy Trust created and began hiring staff for a communities and new initiatives sector, which will be responsible for building and managing community-related initiatives and offers that involve multiple programs, including distributed energy resources and flexible grid management projects. This will streamline support for communities and organizations seeking comprehensive energy solutions.



GOAL 3: Create development capabilities that will allow us to increase funding to deliver more savings and generation and expand our ability to meet changing customer and utility system needs.

OUTCOME: ACHIEVED

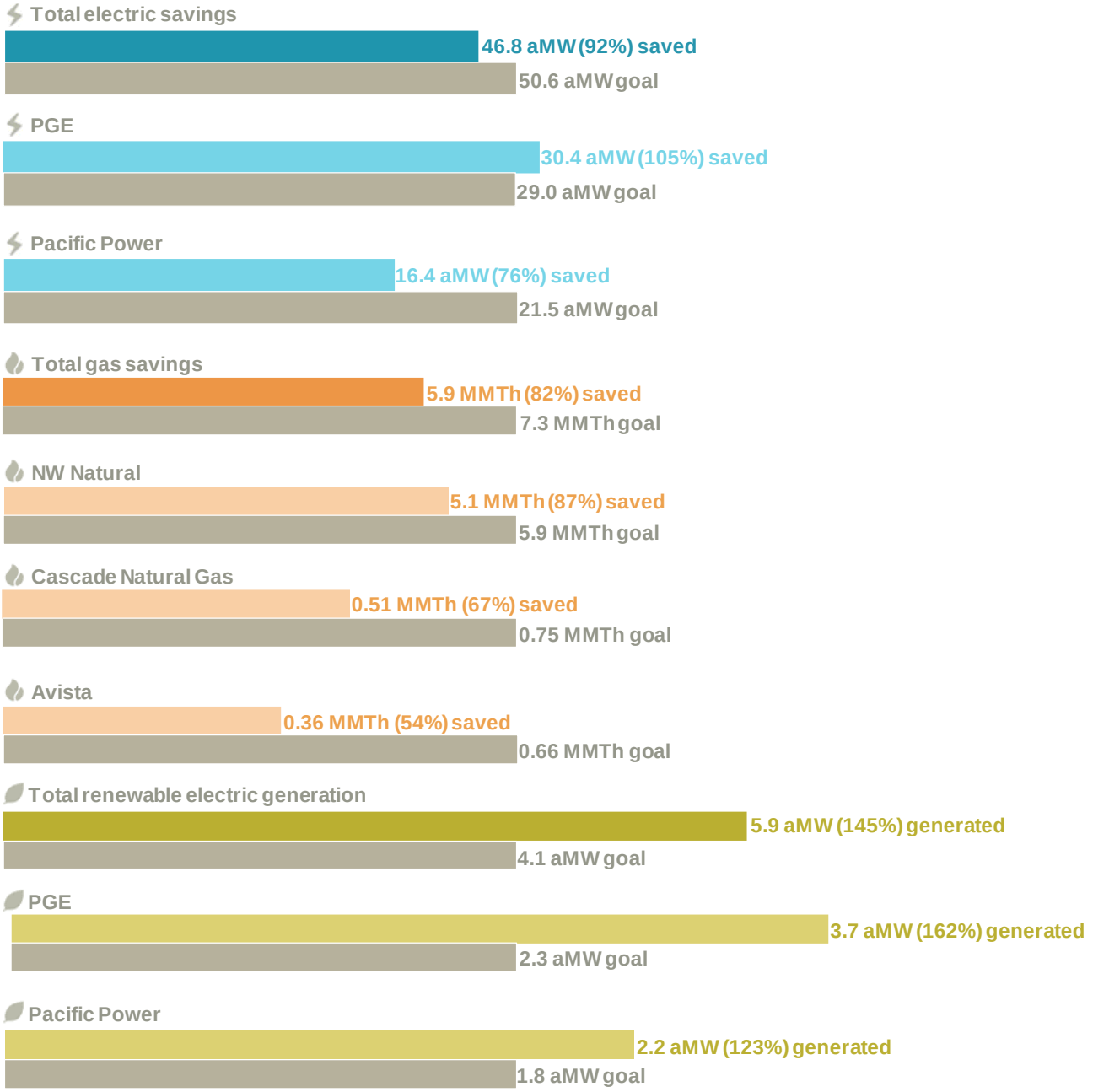
- Energy Trust **created an Innovation and Development team to cultivate strategic partnerships and pursue external funding opportunities** that help more customers access the benefits of energy efficiency and renewable energy. This work aligns with Energy Trust's long-term strategic goals to maximize ratepayer funds by leveraging outside funding and enhancing Energy Trust's ability to respond to new opportunities.
- Staff began meeting internally and with Oregon Department of Energy staff regularly to track developments related to the federal Infrastructure Investments and Jobs Act and the Inflation Reduction Act, both of which will result in funding for local clean energy projects.
- Energy Trust began participating in several projects – including Solar Ambassadors and a Smart Inverter Pilot with PGE – that are funded by contracts and grants outside its core funding. For more information, see Appendix 1.

GOAL 4: Implement new work strategies to adapt and thrive in our changing environment while supporting staff and managing operating costs.

OUTCOME: ACHIEVED

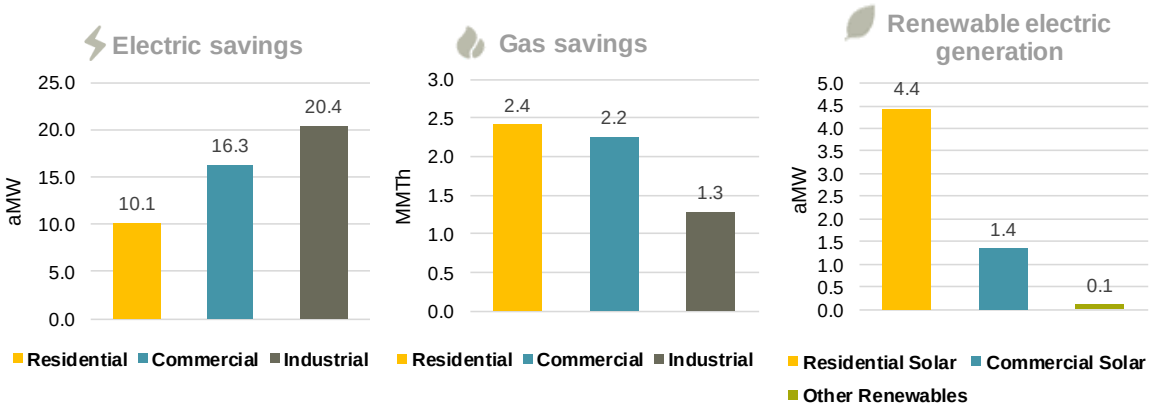
- Energy Trust implemented improvements to its annual planning and budgeting process, including earlier stakeholder engagement and increased coordination with utility partners as required with HB 3141.
- Energy Trust **conducted Learning Lab, a six-month process to test new tools and methods** to improve and support team functioning, engagement and communications amid virtual and hybrid work environments. This included virtual trainings for all staff on communication styles, virtual meetings and continuous improvement. A survey at the end of the process showed increased comfort with virtual work among staff and improved communication, collaboration and meeting productivity.
- Energy Trust created the Innovation and Development team and communities and new initiatives sector to support new activities that broaden and deepen its impact. For more information, see above.
- Staff began implementing Energy Trust's new Diversity, Equity and Inclusion Plan that prioritizes community engagement to inform program delivery. For more information, see Appendix 2.
- The renewable energy sector was restructured in late 2022 to better support equity-focused offers and community engagement. Previously the sector was organized by technology (solar and other renewables); now it is organized by function, with a market-ready solutions group focused on standard incentives and a custom solutions group focused on custom incentives and outreach to community-based organizations.

B. Results at a glance[6]



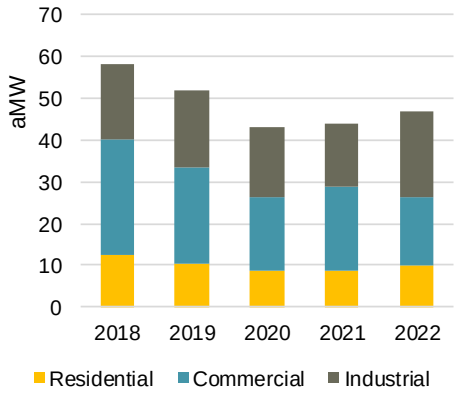
[6] aMW indicates average megawatts, MMTh indicates million therms and MM is million.

2022 savings and generation by sector

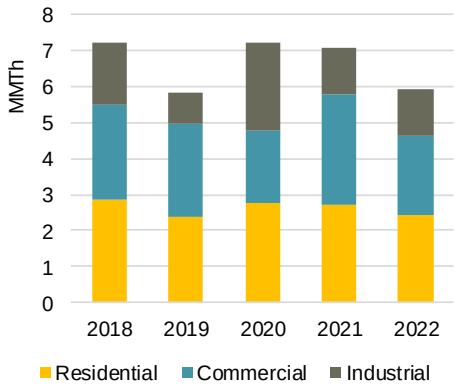


Savings and generation by sector over time

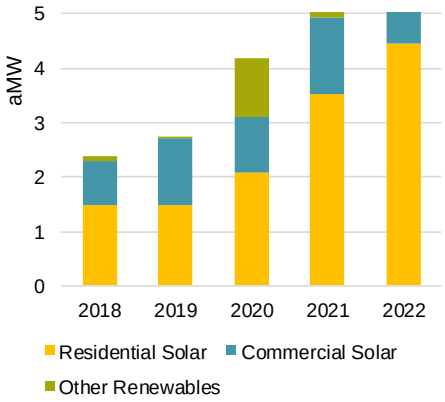
Electric savings by sector (2018-2022)



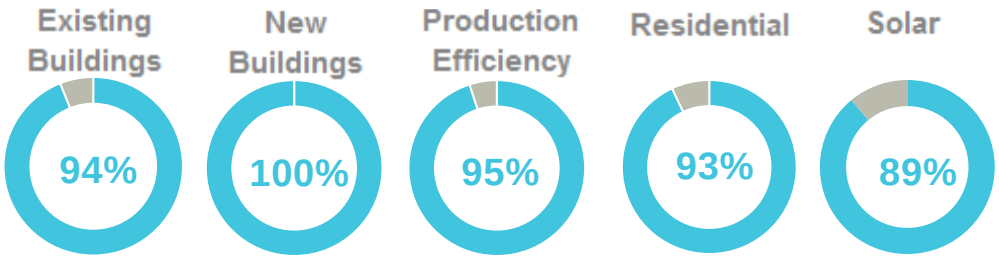
Gas savings by sector (2018-2022)



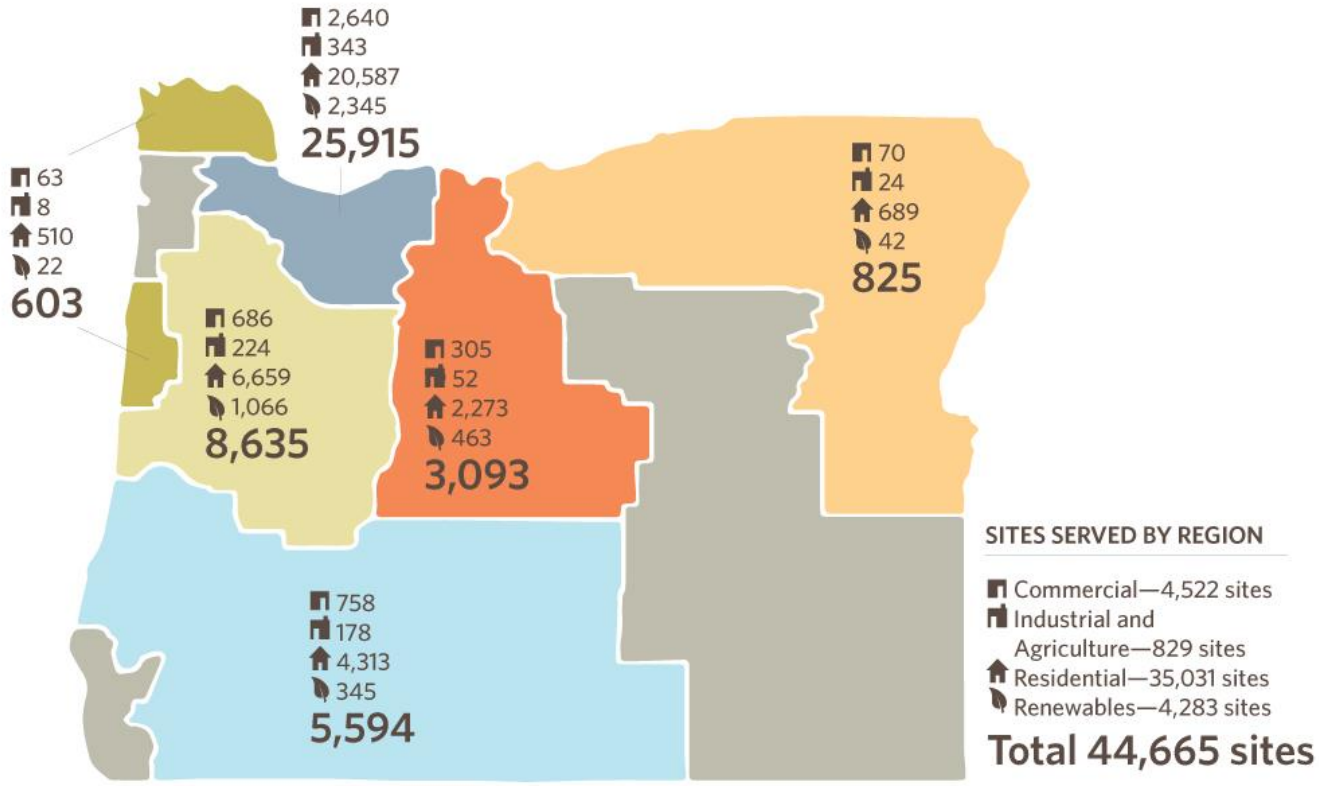
Renewable electric generation by program (2018-2022)



Customer satisfaction[7]



Sites served by region[8,9]



[7] Energy Trust surveyed 743 residential customers and 730 non-residential customers in Oregon who received an incentive or discount from Energy Trust in 2022. New Buildings satisfaction data is from 2022. See Appendix 3 for more information.
[8] This document reports on Energy Trust services to Oregon customers of Portland General Electric, Pacific Power, NW Natural, Cascade Natural Gas and Avista. Areas in gray are not served by these utilities.
[9] Actual participation numbers are higher since midstream offers don't have sites associated with them. The longer-term trend of declining numbers of sites served is due to more midstream offers and the retirement of energy saver kits.

II Programs and operations activity

A. Commercial sector highlights[10]

- The sector achieved 76% of its electric savings goal and 73% of its natural gas savings goal.
- Market conditions including labor and supply shortages and rising prices impacted customers, especially small businesses and businesses in rural areas. While interest in energy-efficiency projects was high at the start of the year, market conditions resulted in fewer project submissions and project completed throughout the year as customers delayed or canceled projects amid economic uncertainty.
    - Rising equipment costs resulted in some projects that have traditionally been cost-effective no longer meeting cost-effectiveness requirements.
    - Additionally, the project pipeline going into 2022 was smaller than typical due to incentive caps introduced in 2021 to manage Energy Trust's budget.
- Existing Buildings **launched the Contractor Development Pathway to support trade allies** certified by the state's Certification Office for Business Inclusion and Diversity (COBID) or eligible for certification. Nine businesses finished the pathway, which provides participating contractors technical, business and programmatic support tailored to their needs.
- Energy Trust introduced higher incentives for small business and selected nine trade allies through a competitive process to serve in the closed Small Business Trade Ally Network. Outreach efforts focused on businesses Energy Trust has historically underserved including those owned by women and people of color. Existing Buildings and business lighting staff worked together to promote these incentives alongside direct install no-cost lighting offers.
- Energy Trust delivered its Strategic Energy Management (SEM) offer virtually to approximately 85 participants across six cohorts, including **a new multifamily cohort with three affordable housing organizations and 12 properties**. Energy Trust worked with Community Energy Project to provide resident engagement workshops for each of these properties.
- Energy Trust redesigned its data center offer in 2022 to better accommodate the needs of these projects. Energy-savings projects at data centers picked up in 2022 after slowing in recent years, with data center projects accounting for a quarter of New Buildings electric savings.
- Commercial savings from NEEA activities comprised 8% of the sector's annual savings in PGE service area, 10% in Pacific Power service area, 6% in NW Natural service area, 14% in Cascade Natural Gas service area and 15% in Avista service area. Electric and gas savings were driven by the 2021 Oregon Zero Energy Ready Commercial Code, which went into effect in October 2021.

[10] The commercial sector is comprised of two programs: Existing Buildings and New Buildings. Existing Buildings, which includes multifamily customers, offers incentives for energy-efficient improvements in existing commercial buildings of all sizes. New Buildings supports design and construction of high-performance commercial buildings and major renovations of all sizes and building types. Lighting offers for commercial customers are delivered separately.

B. Industrial and agricultural sector highlights[11]

- The sector achieved 114% of its electric savings goal and 84% of its natural gas savings goal.
- A megaproject at a technology facility in PGE service area achieved significantly more savings than expected.
- Supply chain disruptions and labor shortages made it harder for customers and trade allies to complete projects, especially in rural areas. Concerns about future economic uncertainty also caused some customers to delay or cancel projects.
- To support and motivate customers, Energy Trust **increased per project incentive caps for standard projects and increased incentives** for certain measures.
- Fewer customers than expected completed calculated irrigation projects, but prescriptive irrigation projects performed well, which could signal customers are opting to maintain existing equipment rather than upgrade it.
- The sector achieved more Strategic Energy Management electric and gas savings than expected as customers sought low- and no-cost ways to reduce energy costs.
    - To further support SEM customers, staff developed a cloud-based performance tracking tool to launch in 2023. This will allow customers, contractors and Energy Trust to track, report and manage energy more effectively.
- Through a competitive bid process, staff recommended and the board of directors approved Energy 350 to serve as Program Management Contractor (PMC) for Production Efficiency non-lighting offers starting in 2023. This selection includes a substantial change to the program's delivery model, moving from four Program Delivery Contractors (PDCs) serving specific geographic areas to one PMC. The new delivery model will **streamline participation for customers and trade allies, reduce costs and free up Energy Trust staff time to focus on new opportunities**.
- Staff held focus groups with English and Spanish-speaking owners of small manufacturing and agricultural businesses to learn more about their goals, concerns and interest in energy efficiency at their businesses. Feedback will inform outreach and future offers for small businesses.
    - Separately, staff developed a method for collecting self-reported demographic and firmographic customer data to track participation by race/ethnicity, gender, ownership, business size and language(s) spoken.
- Industrial savings from NEEA activities comprised approximately 3% of the sector's annual savings in PGE service area and 6% in Pacific Power service area. Electric savings were driven by NEEA's continued influence on federal standards for the electric motor market. (There are no NEEA industrial gas market transformation initiatives.)

[11] The industrial and agriculture sector provides energy-efficiency solutions for eligible industrial, agricultural and municipal water and wastewater recovery facility customers. It consists of one program, the Production Efficiency program, which provides services and incentives through three primary delivery tracks: standard, custom and energy performance management. Lighting offers for industrial customers are delivered separately.

C. Business lighting highlights[12]

- Lighting savings were lower than expected due to supply chain disruptions and increased equipment and labor costs.
- Energy Trust increased incentive amounts and caps and extended reservation timelines to motivate customers and trade allies to complete projects. Staff also reengaged trade allies following program changes in prior years to manage budget challenges related to the pandemic.
- Staff **partnered with rural community leaders to promote a no-cost direct installation offer for small businesses** in Cave Junction, Coos Bay and North Bend; the effort later expanded into Eastern Oregon. Community leaders helped connect Energy Trust staff with members of their local business community. This proved more effective than individually approaching customers.
    - Statewide, Energy Trust completed 568 no-cost direct installation lighting projects, nearly 90% of which were at small businesses. Energy Trust made changes to its outreach process to promote these projects and added installers in rural areas including in Pendleton, Medford and North Bend.
- Staff engaged distributors to help them learn about instant discounts – incentives paid to distributors with savings passed onto customers – that launched in late 2021 and to incorporate them into their sales processes. The number of participating distributors nearly tripled in 2022 as a result of this engagement, and midstream savings increased significantly over the course of the year.

D. Residential sector highlights[13]

- The sector achieved 90% of its electric savings goal and 90% of its natural gas savings goal.
- Demand for housing across the state helped drive higher than expected participation in new construction incentives, and EPS™ saw its largest annual participation (about 4,500 homes) and highest percentage of market participation (about 37%).
- **Smart thermostats exceeded forecasted savings due to promotions late in the year in coordination with all utility partners** that included higher incentive amounts. The promotions reached more than 200,000 customers, leading to almost 20,000 smart thermostats installed in 2022, a 30% increase over 2021.
- Fewer customers installed HVAC, insulation and windows due to ongoing supply chain issues and price increases, while residential contractors reported having trouble hiring and retaining skilled labor after years of pandemic-driven demand. Additionally, customer speculation about the federal Inflation Reduction Act – including when tax credits and rebates would become available and at what level – caused some to delay projects.
- To support contractors and motivate customers, Energy Trust **extended a promotion for gas furnaces and ceiling insulation** that was set to end in October through the end of the year and throughout 2023. This gave contractors more time to promote the offer and

[12] Lighting offers for commercial and industrial customers are delivered by one Program Delivery Contractor. Savings goals are incorporated into commercial and industrial sector goals.
[13] The residential sector provides energy-efficiency solutions for residential customers of single-family homes, manufactured homes and newly constructed homes. Incentives are available for smart thermostats, energy-efficient HVAC and water heating equipment, lighting, appliances, weatherization upgrades, whole-home improvements and new construction.

create a future pipeline of demand for these core offers, which is expected to result in savings in 2023.

- Staff worked with Pacific Power to deliver home energy reports, prioritizing customers with low and moderate incomes. Reports help customers understand their energy usage, offer energy-savings tips and promote Energy Trust incentives. The reports were a leading savings driver in Pacific Power service area, although savings were lower than expected due to fewer reports being delivered than planned.
- At the end of 2022, Energy Trust discontinued incentives for lighting purchased in stores due to advancements in federal minimum standards that made it so all new lighting is considered efficient. Lighting has been a major driver of residential electric savings for the past decade, including in 2022.
    - This was a multiyear phaseout. In the final years, Energy Trust partnered with discount retailers and stores in rural areas to reach specific customer groups the program had not served in the past.
- Residential savings from NEEA activities comprised approximately 44% of the sector's annual savings in PGE service area and 29% in Pacific Power service area. Electric savings were driven by NEEA's ductless heat pump initiative, which aims to accelerate the adoption of ductless heat pumps in electrically heated homes, and NEEA's influence on energy code adoption for single-family and multifamily homes in Oregon. (There were no residential gas savings from NEEA activities in 2022.)

E. Renewable energy sector highlights[14]

- The sector achieved 145% of its electric generation goal.
- Results were driven by continued high demand for residential solar energy systems. Energy Trust provided **incentives for more than 3,600 rooftop solar projects in 2022, twice as many projects than were supported in 2020**. Along with Energy Trust incentives, demand was driven by the increased federal tax credit for solar purchases starting in 2022 as part of the Inflation Reduction Act.
- Energy Trust prioritized equity-focused solar offers, with more than one-half of solar incentive funds going to income-qualified customers, qualifying nonprofits, tribes, affordable multifamily housing and community solar projects that benefit communities with low incomes. Meanwhile, utility data show more market-rate solar projects moving forward without Energy Trust incentives than in previous years, driven by projects completed by contractors who are not in Energy Trust's Trade Ally Network.
- To ensure solar projects moved forward amid equipment price increases, **Energy Trust approved equipment and payment timeline changes where needed**. Most smaller and residential projects could absorb price increases since equipment costs make up a smaller portion of total project costs and contractors were able to design systems based on what equipment was available.
    - Meanwhile, the temporary resolution in June of a tariff issue provided some market stability. The federal government suspended import tariffs on solar panels

[14] Through 2022, the renewable energy sector was comprised of two programs: Solar and Other Renewables. The Solar program offered standard incentives for small-scale distributed systems for residential, business, public sector and nonprofit customers. The Other Renewables program supported renewable energy projects up to 20 megawatts in nameplate capacity that generate electricity using biopower, geothermal, hydropower and community-scale, municipally owned wind technologies. The sector was restructured in late 2022; for more information, see page 7.

for two years following an investigation into tariffs paid on Chinese-made panels; the issue had threatened equipment availability for mostly large projects.

- Energy Trust underspent on incentives for small and low-income community solar projects due to projects advancing slower than expected. To help move these projects forward, Energy Trust offered development assistance incentives and contracted with Bonneville Environmental Foundation to provide coaching for nonprofit, public and low-income focused community solar projects.
    - Additionally, Energy Trust underspent on incentives for Solar Within Reach projects in Pacific Power service area due to low contractor availability, low customer awareness and lasting effects of incentive reductions in 2021.
- Energy Trust and Farmers Conservation Alliance's Irrigation Modernization Program, which helps irrigation districts replace open air canals with pipes and creates opportunities to produce hydropower where possible, marked the completion of piping of the Three Sisters Irrigation District. **The district has replaced 62 miles of canals over the past 20 years and its McKenzie hydropower project achieved commercial operation in December**, its third hydropower project to date for a total of 1.2 megawatts of installed hydropower capacity.
    - Elsewhere, the Burnt River Irrigation District completed a system improvement plan and the Lacomb and Tualatin Valley irrigation districts entered into participation agreements with the program.

F. Internal operations highlights[15]

- Customer service staff hosted the first in-person Trade Ally Forums since the start of the pandemic in Portland, Bend and Grants Pass to deliver program updates and training to residential, multifamily and solar trade allies.
- Policy staff monitored and informed proceedings of the 2022 legislative session, which saw the passage of SB 1536 that included funds for the Oregon Department of Energy for the Landlord Provided Cooling Space Initiative administered by Energy Trust.
- Policy staff **monitored and informed proceedings of the Oregon Legislature's Task Force on Resilient, Efficient Buildings**, which considered and ultimately recommended a number of building emissions reductions policy options to the full legislature with some options potentially affecting Energy Trust activities.
- Policy staff helped organize a roundtable on energy and equity provisions in the Inflation Reduction Act, held at Energy Trust's office. Reps. Blumenauer and Bonamici, Speaker Pelosi, Energy Trust staff and other stakeholders participated in the event.
- Web staff created a new online tool to make it **easier for residential customers to find what incentives they are eligible for** and updated a page on contracting opportunities to highlight the supplier diversity program and let businesses sign up to receive solicitations from Energy Trust when opportunities arise.
- Outreach staff helped design and implement a workshop bringing together multiple agencies and organizations around the state to coordinate solicitation of U.S. Department

[15] Energy Trust's internal operations teams include communications, customer service, general marketing, Trade Ally Network management, outreach, policy services, IT, operations support, and planning and evaluation.

of Agricultural Rural Development funding and maximize Oregon's energy efficiency and renewable energy opportunities for rural businesses.

- Outreach staff collaborated with Pacific Power, Avista and ODOE staff on a training for the City of Grants Pass's new Sustainability and Energy Action Team.
- Outreach staff supported engagement sessions to get feedback on Energy Trust's Diversity, Equity and Inclusion Plan. For more information, see Appendix 2.
- Outreach team helped develop and track new relationships with community groups. More than 40 new relationships were identified in 2022 with organizations such as Black Rural Network and Metropolitan Family Services.
- Communications staff helped promote Energy Trust to reporters, resulting in more than 300 news stories. **National publications including Fast Company, Washington Post and Bloomberg** highlighted Energy Trust's support of efficiency and renewable energy projects and their climate benefits. The combined publicity value of media coverage for 2022 – what it would have cost to purchase the equivalent advertising space and airtime – was nearly $87 million.
- IT staff launched multi-factor user authentication and conducted firewall tests and email phishing tests to promote system security.
- Evaluations staff completed and published nine evaluation and market research reports. Staff also **began hosting quarterly public webinars to present evaluation results** and formed an Evaluation Advisory Group to provide outside perspectives on Energy Trust's evaluation and research portfolio, guidelines, methods and results.
- Planning staff supported integrated resource plan (IRP) processes for all five utility partners.
- Planning staff supported utility local distribution planning efforts including tracking the OPUC Distribution System Planning docket (UM 2005) and studied how to quantify and report on utility capacity benefits related to OPUC docket UM 2011.

III Updates requested by the OPUC

This section provides information requested by the OPUC in comments on Energy Trust's 2022 Budget and 2022-2023 Action Plan, plus other information requested by OPUC staff.

Development of peak modeling capabilities:

- Staff worked with utility and OPUC staff to develop a technical approach to modeling peak energy use that is consistent with utility forecasts of capacity need. Staff also discussed with PGE and Pacific Power how they plan to forecast capacity. Energy Trust updated modeling concepts for valuing capacity from efficiency and renewable energy measures and plans to incorporate utility responses into a new modeling approach based on those concepts in 2023.

Identifying measures that maximize greenhouse gas reduction impacts for electric and gas utilities based on the time of day and year:

- Energy Trust developed an updated methodology for estimating carbon avoided through its efficiency and renewable energy measures that links an hourly forecast of grid and gas system emissions to information on the timing of energy savings and generation. Staff then developed a draft ranking of measures by carbon intensity of savings.
- The updated methodology was used to quantify carbon impacts for 2022 and to forecast carbon savings in Energy Trust's 2023- 2024 budget.

Residential measures that have peak impacts:

- The following measures with peak impacts were developed in 2022: ceiling, wall and floor insulation; windows to replace inefficient existing condition windows such as single-pane and double-pane metal frame windows; ductless heat pumps and extended capacity heat pumps for electric-heated homes.
- Staff developed applications for extended capacity heat pumps to displace existing forced air electric furnaces. This provides the greatest impact to peak heating savings and provides more efficient cooling than standard air conditioning and heat pump equipment.

Supplier diversity tracking system:

- Energy Trust completed development of a supplier diversity tracking system to support efforts to increase contracting opportunities with firms certified by the Oregon Certification Office for Business Inclusion and Diversity. Staff will begin reporting on results of these supplier diversity efforts in 2023.
- Staff who manage contracts attended trainings on Energy Trust's supplier diversity program, which was finalized in 2021.

Diversity, equity and inclusion activities:

- Energy Trust completed competitive solicitation processes for management and delivery of its Production Efficiency and Residential programs. Staff recommended and the board of directors approved a PMC for the Production Efficiency program and a PMC and two PDCs for the Residential program. Both solicitations were structured with the goal of increasing diversity within the implementation teams. Staff worked to connect majority-owned firms with small businesses and those owned by women and people of color so they could work together on proposals.

- Staff helped create a consortium of supplier diversity administrators from different agencies called Contracting Alliance for Diversity & Equity and hosted a workshop for small business owners, women and people of color to learn about contracting opportunities.
- Staff supported the OPUC and its consultant in planning and conducting community outreach to inform development of the inaugural set of equity metrics for Energy Trust's investment of ratepayer funds.
- Board members participated in diversity, equity and inclusion training in October and December, with trainings set to continue throughout 2023.
- Energy Trust held monthly First Thursday events for staff and the public that highlighted the history and stories of marginalized groups including events in honor of Black History Month, Women's History and Hispanic Heritage Month.

No-cost ductless heat pump pilot for customers with low incomes:

- Energy Trust installed ductless heat pumps at 26 single-family homes and 103 multifamily units as part of the no-cost pilot developed and delivered with partners. Energy Trust is working with seven community-based organizations, tribes and a community action agency to facilitate customer participation. These partners qualified sites and negotiated pricing with contractors.
    - The pilot, for which Energy Trust received a cost-effectiveness exemption from the OPUC to invest up to $5 million, seeks to learn how to identify and serve customers with high energy burdens and reduce their costs while making their homes more comfortable.
    - An additional 102 no-cost installations are currently in the queue to be installed in 2023.

IV Progress to 2022 OPUC performance measures

Each year, the Oregon Public Utility Commission (OPUC) establishes minimum performance measures for Energy Trust in a variety of categories. Minimum savings and generation figures for energy-efficiency programs and renewable energy programs are set at an aggregated level rather than at an individual program or sector level. This allows Energy Trust to pursue different program strategies in the residential, commercial and industrial sectors as market forces and technologies change. Electric and gas efficiency performance targets are set at 85% of Energy Trust goals as defined in annual budgets. The following OPUC minimum performance measures apply to Energy Trust 2022 results.

Amid challenging market conditions, Energy Trust fell short of efficiency performance measures in Pacific Power, Cascade Natural Gas and Avista service areas. Staff communicated challenges in these areas to OPUC staff throughout 2022, and Energy Trust has set more conservative efficiency goals for 2023.

Category	Measure	Result
Electric efficiency	PGE: • Save at least 24.7 aMW • Levelized cost not to exceed 4.0 cents/kWh Pacific Power: • Save at least 18.3 aMW • Levelized cost not to exceed 3.9 cents/kWh	PGE: ✓ **Exceeded**, with 30.4 aMW saved ✓ **Within requirement**, levelized cost at 2.8 cents/kWh Pacific Power: ☐ **Out of compliance**, with 16.4 aMW saved ✓ **Within requirement**, levelized cost at 3.9 cents/kWh
Natural gas efficiency	NW Natural: • Save at least 4.9 million annual therms • Levelized cost not to exceed 54 cents/therm Cascade Natural Gas: • Save at least 0.64 million annual therms • Levelized cost not to exceed 63 cents/therm Avista: • Save at least 0.56 million annual therms • Levelized cost not to exceed 59 cents/therm	NW Natural: ✓ **Exceeded**, with 5.1 million annual therms saved ✓ **Within requirement**, levelized cost at 48.9 cents/therm Cascade Natural Gas: ☐ **Out of compliance**, with 0.51 million annual therms saved ✓ **Within requirement**, levelized cost at 56.0 cents/therm Avista: ☐ **Out of compliance**, with 0.36 million annual therms saved ✓ **Within requirement**, levelized cost at 48.6 cents/therm
Renewable energy	For project and development assistance (part 1), deploy at least $1.5 million in non-solar project development assistance incentives. Maintain a non-solar project development assistance pipeline in excess of 25 projects. Report number of projects served and total dollars spent and	☐ **Out of compliance**, paid $1,032,690 in project development assistance to 30 projects. Energy Trust exceeded the requirement for number of projects in the pipeline but was short of the requirement for dollars deployed. This was due to inflation

	summarize project progress through development stages.	and related project cost increases, delayed projects by municipalities and delays in enrolling two districts in irrigation modernization. For more information, see Appendix 5.
	For project and market development assistance (part 2), report annual results, including number of projects supported, milestones met and documentation of results from market and technology perspective.	✓ **In compliance**, see Appendix 5.
	Obtain at least 3.4 aMW of installed generation of standard net-metered Solar program projects.	✓ **Exceeded**, with 5.83 aMW of installed generation from standard solar projects.
	For solar projects funded outside of the Solar program's standard, net-metered incentive offer, report sources of funding for projects and the criteria for selection.	✓ **In compliance**, paid incentive funds for two small-scale community solar projects and dedicated incentive funds for a large-scale community solar project, both with low-income subscribers. For more information, see Appendix 10.
	Invest at least $3.8 million, 25% of public purpose revenue for renewables, to provide activities, resources and technologies for low and moderate income customers.	✓ **In compliance,** Energy Trust invested $5.1 million or 29% of revenues to benefit customers with low and moderate incomes. For more information, see Table E in Section V.
Financial integrity	Receive an unmodified financial opinion from an independent auditor on annual financial statements.	✓ **In compliance**, with an unmodified financial audit opinion for 2022.
Administrative/ program support costs	Keep administrative/program support costs below 8% of annual revenues (no more than $16,183,690).	✓ **In compliance**, with 2022 administrative/program support costs of 7% of annual revenues ($14,083,874).
	Administrative/program support cost growth limited to 10% year-over-year increase (no more than $1,244,881).	• **Performance measure waived**, with administrative/program support cost growth of 13% year-over-year ($1,635,062). The OPUC agreed to waive this performance measure in 2022 to allow for more spending in support of acquiring more cost-effective energy savings, including efforts to hire new staff to balance workloads and help retain existing staff.
Staffing expenditures	Staffing cost growth is limited to 9% year-over-year increase (no more than $1,373,915).	• **Performance measure waived**, with staffing cost growth of 11% year-over-

		year ($1,660,605). See waiver explanation above.
Customer satisfaction	Demonstrate greater than 85% satisfaction rates for interaction with program representatives and overall satisfaction.	✓ **In compliance**, with a 94% satisfaction rate for interaction with program representatives and a 94% overall satisfaction rate. Results for major programs are averaged to determine satisfaction rates. See Appendix 3.
Benefit/cost ratios	Report utility system and societal perspective annually. Report significant mid-year changes as warranted in quarterly reports.	✓ **In compliance**, with no mid-year changes, see table below.
NEEA and market transformation	Report annually: • Savings and costs • Savings strategies • Show Energy Trust direction to NEEA through committee membership • Summary of Energy Trust direction to NEEA • Summary of NEEA initiatives Energy Trust opts out of and why	✓ **In compliance**, see Section VIII.
Diversity, equity and inclusion	Energy Trust will come to the equity performance metrics discussions prepared to provide information requested by the Commission as outlined in the budget related to: • Key communities by utility service territory • Impact of alternative fuels • Low-cost cooling measure opportunities Energy Trust shall conduct a minimum of four engagement activities with community organizations to present, refine and finalize Energy Trust goals for DEI Operations.	✓ **In compliance**, Energy Trust staff participated in equity performance metrics discussions, provided requested information and assisted OPUC staff in organizing and facilitating these events where possible. ✓ **In compliance**, staff held events with rural and urban community-based organizations, workforce groups and tribal members to get feedback. For more information, see Appendix 2.

Benefit/cost ratios

- Report benefit/cost ratios for larger conservation acquisition programs for both utility system and total resource perspective

2022 Utility Cost and Total Resource Cost by program

Program	Combined Utility Cost Test benefit/cost ratio	Combined Total Resource Cost Test benefit/cost ratio
Residential	2.2	1.7
Existing Buildings, including multifamily	1.9	1.2
New Buildings[16]	2.5	N/A
Production Efficiency	4.0	2.8

2023 equity metrics baseline data

In 2022, the OPUC developed new equity performance measures for Energy Trust starting in 2023, as required by HB 3141. This table provides data for 2022 on activities that will be reported by Energy Trust in 2023.[17] Data for 2022 will serve as a baseline for reporting purposes.

2023 metric	Data to be reported	2022 data	Activities included in 2022 figure
Increase support to nonprofit organizations with a purpose to serve environmental justice communities or to support nonprofit-led initiatives serving environmental justice communities. Support can be incentives, training and funding for energy efficiency upgrades, solar or solar + storage projects.	Budget to support capacity building at environmental justice nonprofits	$1,600,000	Working Together Grants for nonprofits to promote participation in Energy Trust offers; contracts with various community-based organizations, including to lead workshops that reach environmental justice communities and promote workforce development that benefits environmental justice communities; Community Partner Funding incentives for home improvement projects in environmental justice communities delivered through qualifying nonprofits
Increase funding to support targeted outreach to environmental justice communities, including funding for community ambassadors,	Number of full-time equivalent (FTEs) involved in outreach to environmental justice communities	16.5 FTE	The number of FTEs among Energy Trust and contracted staff for dedicated outreach support to rural communities, communities of color and customers with low incomes; Energy Trust staff supporting Solar Ambassadors, a collaborative effort to connect underserved communities with solar

[16] New Buildings currently operates under a cost-effectiveness exception granted by the OPUC due to the structure of the new state building code.
[17] energytrust.org/wp-content/uploads/2023/03/2023-OPUC-measures.pdf

education and workshops.			energy funded by the National Renewable Energy Lab
	Number of community and ambassador work group members	12 members	Members of external community working groups that advise Energy Trust program and outreach staff
Create and launch new and expanded low-cost and no-cost offers to reduce energy burden.	Total count of no- and low-cost residential efficiency offers	8	No-cost ductless heat pump offer for residents with low incomes; no-cost duct sealing offer for residents of manufactured homes; no-cost in-home Home Energy Assessments; no-cost online Home Energy Assessment; low-cost home ceiling insulation offer; no-cost energy management services for affordable housing providers and residents; no-cost do-it-yourself cooling workshops for renters; low-cost smart thermostats for all residential customers
Support solar and solar + storage system projects for low- and moderate-income residents in areas with limited infrastructure or high energy burden.	Budget for solar + storage incentives for residents with low and moderate incomes	$140,000	Incentives for solar + storage systems (installation incentives based on solar portion of the project only)

V Revenues and expenditures tables[18,19,20]

A. Revenues under OPUC grant agreement

Source		Annual actual revenues		Annual budgeted revenues	Budget variance
PGE Efficiency	$	84,529,304	$	84,833,700	0%
PGE Renewables	$	10,773,985	$	8,818,840	22%
Pacific Power Efficiency	$	58,202,363	$	56,640,480	3%
Pacific Power Renewables	$	6,870,486	$	6,378,060	8%
NW Natural	$	26,838,859	$	28,242,500	-5%
NW Natural Industrial DSM	$	6,031,586	$	6,031,586	0%
Cascade Natural Gas	$	4,106,257	$	3,867,475	6%
Avista	$	4,943,292	$	4,943,292	0%
Total	**$**	**202,296,131**	**$**	**199,755,933**	**1%**

B. Expenditures under OPUC grant agreement[21]

Source		Annual actual expenditures		Annual budgeted expenditures	Budget variance
Portland General Electric	$	87,364,845	$	104,051,018	-16%
Pacific Power	$	55,125,095	$	67,040,501	-18%
NW Natural	$	24,332,741	$	27,292,627	-11%
NW Natural Industrial DSM	$	5,125,261	$	7,073,683	-28%
Cascade Natural Gas	$	3,601,925	$	5,235,731	-31%
Avista	$	2,461,378	$	4,650,521	-47%
Total	**$**	**178,011,245**	**$**	**215,344,082**	**-17%**

[18] Columns may not total due to rounding.
[19] Gas savings do not include results for NW Natural in Washington. These results are available in the total organization appendix.
[20] Revenues include ratepayer revenue collected for energy-efficiency programs and ratepayer-funded public purpose charge revenues collected for renewable energy activities.
[21] Unspent funds are carried over into the following budget year and budgeted revenues for that year are adjusted accordingly.

C. Expenditures under OPUC grant agreement by sector and program[22]

			Annual actual expenditures		Annual budgeted expenditures	Budget variance
Commercial	Existing Buildings	$	46,433,031	$	61,496,783	-24%
	New Buildings	$	14,386,279	$	18,381,199	-22%
	NEEA Commercial	$	2,731,734	$	3,773,921	-28%
	Commercial total	**$**	**63,551,044**	**$**	**83,651,904**	**-24%**
Industrial	Production Efficiency	$	31,798,425	$	40,988,386	-22%
	NEEA Industrial	$	50,574	$	34,849	45%
	Industrial total	**$**	**31,848,999**	**$**	**41,023,235**	**-22%**
Residential	Residential	$	49,224,180	$	53,231,445	-8%
	NEEA Residential	$	4,645,784	$	4,748,982	-2%
	Residential total	**$**	**53,869,964**	**$**	**57,980,427**	**-7%**
	Energy efficiency total	**$**	**149,270,007**	**$**	**182,655,566**	**-18%**
Renewables	Solar	$	13,167,944	$	15,285,265	-14%
	Other Renewables	$	4,865,152	$	6,051,265	-20%
	Renewable generation total	**$**	**18,033,096**	**$**	**21,336,530**	**-15%**
	Administration	**$**	**10,708,142**	**$**	**11,351,987**	**-6%**
	Total	**$**	**178,011,245**	**$**	**215,344,082**	**-17%**

D. Incentives paid

Qtr	PGE efficiency	Pacific Power efficiency	NW Natural efficiency	Cascade Natural Gas efficiency	Avista efficiency	PGE generation	Pacific Power generation	Total
Q1	$ 5,240,468	$ 2,384,863	$ 2,376,681	$ 194,359	$ 111,549	$1,603,475	$ 522,337	$ 12,433,732
Q2	$ 5,769,540	$ 4,142,581	$ 2,265,033	$ 238,774	$ 221,012	$2,592,224	$ 916,675	$ 16,145,837
Q3	$ 7,922,522	$ 4,939,583	$ 3,825,259	$ 357,805	$ 270,012	$1,809,575	$ 839,634	$ 19,964,391
Q4	$18,072,280	$12,677,992	$ 6,610,934	$ 888,060	$ 590,458	$3,150,660	$1,419,541	$ 43,409,925
Total	**$37,004,810**	**$24,145,019**	**$15,077,907**	**$1,678,997**	**$1,193,031**	**$9,155,934**	**$3,698,187**	**$ 91,953,885**

E. Low- and moderate-income renewable energy expenditures[23]

	Annual renewable revenues		Annual LMI expenditures	Percent of revenues benefiting LMI customers
Portland General Electric	$ 10,773,985	$	3,908,501	36%
Pacific Power	$ 6,870,486	$	1,179,109	17%
Total	**$ 17,644,470**	**$**	**5,087,610**	29%

[22] Administration is different than administrative and program support costs as defined by the OPUC's performance measure, which also includes program costs in the following areas: program management, program delivery, program incentives, program payroll and related expenses, outsourced services, planning and evaluation services, customer service management and Trade Ally Network management.
[23] This table reports on a 25% minimum renewable energy spending requirement for Energy Trust under HB 3141. Revenues include all renewable energy revenues, and expenditures are only those that benefit customers with low and moderate incomes.

VI Savings and generation tables[24,25,26,27]

A. Savings and generation by fuel

	Annual savings/generation	Annual goal	Percent Achieved	Levelized Cost
Electric savings	46.8 aMW	50.6 aMW	92%	3.1 ¢ per kWh
Natural gas savings	5,942,844 therms	7,265,422 therms	82%	49.5 ¢ per therm
Electric generation	5.93 aMW	4.10 aMW	145%	2.9 ¢ per kWh

B. Progress toward annual efficiency goals by utility

	Annual savings	Levelized cost	Annual goal	Percent achieved YTD	Annual IRP target	Percent achieved YTD
Portland General Electric	30.4 aMW	2.8 ¢ per kWh	29.0 aMW	105%	24.8 aMW	122%
Pacific Power	16.4 aMW	3.9 ¢ per kWh	21.5 aMW	76%	18.7 aMW	87%
NW Natural	5,079,014 therms	48.9 ¢ per therm	5,853,279 therms	87%	6,062,451 therms	84%
Cascade Natural Gas	508,067 therms	56.0 ¢ per therm	752,829 therms	67%	485,188 therms	105%
Avista	355,763 therms	48.6 ¢ per therm	659,313 therms	54%	447,273 therms	80%

C. Electric savings by sector and program

		Annual savings aMW	Annual goal aMW	Percent achieved	Levelized cost per kWh
Commercial	Existing Buildings	10.2	15.3	67%	4.7 ¢
	New Buildings	4.6	4.8	97%	2.9 ¢
	NEEA Commercial	1.4	1.4	102%	3.4 ¢
	Commercial total	**16.3**	**21.5**	**76%**	**4.0 ¢**
Industrial	Production Efficiency	19.6	17.0	116%	1.9 ¢
	NEEA Industrial	0.7	0.8	91%	0.1 ¢
	Industrial total	**20.4**	**17.8**	**114%**	**1.8 ¢**
Residential	Residential	6.5	7.5	86%	6.0 ¢
	NEEA Residential	3.7	3.8	96%	1.3 ¢
	Residential total	**10.1**	**11.3**	**90%**	**4.3 ¢**
	Total electric savings	**46.8**	**50.6**	**92%**	**3.1 ¢**

[24] Columns may not total due to rounding.
[25] Electric savings also include transmission and distribution savings.
[26] The gas savings do not include results for NW Natural in Washington. These results are available in the total organization appendix.
[27] Energy Trust reports 100% of generation and capacity for renewable energy installations supported by Energy Trust's cash incentives. While some of these projects have additional sources of funding, Energy Trust enabled project completion.

D. Natural gas savings by sector and program

		Annual savings therms	Annual goal therms	Percent achieved	Levelized cost per therm
Commercial	Existing Buildings	1,733,530	2,469,687	70%	60.9 ¢
	New Buildings	346,119	437,460	79%	42.4 ¢
	NEEA Commercial	167,871	167,873	100%	41.0 ¢
	Commercial total	**2,247,520**	**3,075,020**	**73%**	**56.3 ¢**
Industrial	Production Efficiency	1,286,777	1,528,067	84%	23.8 ¢
	NEEA Industrial	-	-	-	-
	Industrial total	**1,286,777**	**1,528,067**	**84%**	**23.8 ¢**
Residential	Residential	2,408,548	2,662,335	90%	53.6 ¢
	NEEA Residential	-	-	-	-
	Residential total	**2,408,548**	**2,662,335**	**90%**	**56.3 ¢**
	Total natural gas savings	**5,942,844**	**7,265,422**	**82%**	**49.5 ¢**

E. Renewable electric generation by utility

	Annual generation aMW	Annual goal aMW	Percent achieved YTD
Portland General Electric	3.71	2.29	162%
Pacific Power	2.22	1.80	123%
Total	**5.93**	**4.10**	**145%**

F. Renewable electric generation by program

	Annual generation aMW	Annual goal aMW	Percent achieved YTD
Solar	5.83	3.98	146%
Other Renewables	0.11	0.11	92%
Total generation	**5.93**	**4.10**	**145%**

G. Utility-invested efficiency expenditures[28]

Utility	Q4 expenditures	Total annual expenditures
Portland General Electric	$ 199,692	$ 786,226
Pacific Power	$ 183,804	$ 905,132
Total	**$ 383,496**	**$ 1,691,358**

[28] This reflects utility investments of a portion of efficiency tariff funds. Funds are collected by the utility and are in addition to funds received by Energy Trust. Reports detailing activities funded by these expenditures are submitted annually by the utilities to the OPUC.

VII Northwest Energy Efficiency Alliance activities and results

To deliver low-cost energy for customers, Energy Trust has been working with the Northwest Energy Efficiency Alliance (NEEA) since 2002 to increase the availability and adoption of energy-efficient electric products, equipment and practices. In 2015, natural gas equipment was added; 2020 was the first year Energy Trust reported gas savings.

By pooling resources at a regional level to work with manufacturers, distributors and retailers, NEEA accelerates the development, testing and distribution of new energy-saving equipment and approaches. NEEA identifies and refines new high-efficiency products, services and practices and helps bring them to market. Once products are ready and available, Energy Trust creates and implements programs to support broad market adoption in Oregon.

Utility customers benefit by seeing a greater choice of higher-efficiency products available through contractors and at stores, through improved pricing and quality for efficient products, and through improvements to building codes and equipment and product standards that will save energy.

NEEA savings noted here are forecasted. Updated savings results will be available late in the second quarter of 2022 through NEEA's annual report.

A. NEEA natural gas savings[29]

	Annual savings therms	Annual energy target therms	Percent achieved	Levelized cost per therm
Commercial	167,871	167,873	100%	38.5 ¢
Industrial	-	-	-	-
Residential	-	-	-	-
Total	**167,871**	**167,873**	**100%**	**131.3 ¢**

B. NEEA electric savings

	Annual savings aMW	Annual energy target aMW	Percent achieved	Levelized cost per kWh
Commercial	1.4	1.4	102%	3.2 ¢
Industrial	0.7	0.8	91%	0.1 ¢
Residential	3.7	3.8	96%	1.2 ¢
Total	**5.8**	**6.0**	**97%**	**1.4 ¢**

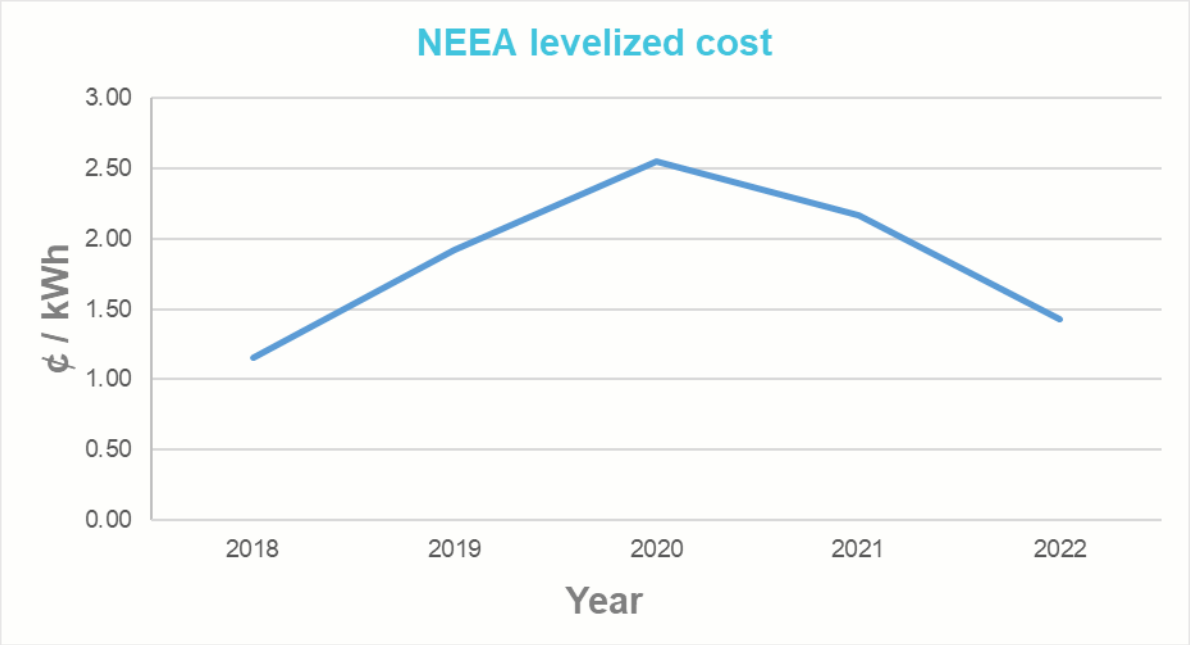
[29] Levelized costs in Table A do not include gas costs or administrative costs. Elsewhere in the report, levelized costs are calculated using administrative costs. Total levelized cost per therm includes spending on industrial and residential activities.

C. NEEA expenditures

	Annual actual expenditures	Annual budgeted expenditures	Budget variance
Commercial	$ 2,906,578	$ 3,983,937	-27%
Industrial	$ 53,811	$ 36,788	46%
Residential	$ 4,943,135	$ 5,013,259	-1%
Total	**$ 7,903,524**	**$ 9,033,984**	**-13%**

D. NEEA electric levelized cost

NEEA costs and savings are not realized in the same year. Savings in 2022 reflect costs from prior years, and costs from 2022 will lead to savings in subsequent years. For this reason, levelized costs are included for the past five years.



Levelized costs reflect NEEA's product development cycle. In the last cycle (2015-2019), electric savings were inexpensive due to large amounts of savings from early iterations of codes and standards along with NEEA's TV and lighting initiatives. In the coming years, NEEA forecasts higher electric savings and decreasing year-over-year levelized costs, however Energy Trust does not expect to see annual levelized costs at similar levels as the previous business cycle.

E. NEEA electric market transformation long-term goals and strategies

Below are NEEA's long-term goals and strategies as outlined in NEEA's 2020-2024 Business Plan. More information on NEEA's market transformation strategies, processes and performance metrics is available in NEEA's 2020-2024 Business Plan and recent annual or quarterly reports.[30]

[30] Available online at neea.org.

Goal 1: Sustain a portfolio of initiatives and support functions that enable more cost-effective efficiency to occur sooner, in larger amounts and/or at lower cost than otherwise expected. Key strategies:

- Routinely scan for, assess and report on the potential for newly identified efficiency products, services and practices and test the field performance of the most promising opportunities.
- Implement the prioritized portfolio of initiatives, routinely evaluate progress and adapt as necessary to achieve accelerated and sustained market adoption.
- Influence development and support successful implementation of building codes and equipment efficiency standards and test methods to materially improve efficiency outcomes.
- Selectively support dialogue and coordinate activities among stakeholders interested in accelerating energy efficiency through market transformation in the Northwest.
- Research, analyze and provide actionable insight to support identification and pursuit of efficiency opportunities and results reporting.

Goal 2: Continuously improve organizational culture and performance efficacy, ensure accountability and transparency and strive for innovation in service to the benefit of all stakeholders. Key strategies:

- Engage funders and other qualified advisors to identify, develop and sustain a portfolio of efficiency-enabling initiatives and activities that are consistent with the alliance's purpose.
- Establish board-determined policies to assure equitable allocation and appropriate prioritization of efforts.

F. Energy Trust membership on NEEA committees and direction to NEEA

Energy Trust provided guidance to NEEA in 2022 through Executive Director Michael Colgrove's service as vice chair of the NEEA board of directors; he became board chair in 2023. Additionally, Energy Trust staff participated in a variety of NEEA's advisory groups.

Committee	Energy Trust staff member
Strategic Planning Committee	Michael Colgrove, executive director
Executive Committee	Michael Colgrove, executive director
Natural Gas Committee	Michael Colgrove, executive director
Business Planning Committee	Michael Colgrove, executive director
Ad hoc Executive Director Search Committee	Michael Colgrove, executive director
Regional Portfolio Advisory Committee	Fred Gordon, director of planning and evaluation
Cost-effectiveness and Evaluation Advisory Committee	Ben Cartwright, senior planning project manager
Regional Emerging Technology Advisory Committee	Kenji Spielman, planning & evaluation engineer
Natural Gas Advisory Committee	Jackie Goss, senior planning & evaluation engineer
Residential Building Stock Assessment Working Group	Dan Rubado, evaluation senior project manager

Products Coordinating Committee	Thad Roth, residential sector lead
Integrated Systems Coordinating Committee	Oliver Kesting, commercial sector lead
End Use Load Research Steering Committee	Michael Colgrove, executive director
End Use Load Research Working Group	Sarah Castor, evaluation & engineering manager
Commercial Building Stock Assessment Working Group	Jackie Goss, senior planning & evaluation engineer

Energy Trust staff provided the following to NEEA through committee participation in 2022:

- Executive leadership and insights on the selection of NEEA's new executive director
- Support for advancing initiatives for packaged pump/drive systems, high-performance heating/cooling systems, stand-alone efficient fans and efficient rooftop units
- Feedback and direction on initiatives for heat pump water heaters, retail products and extended motors
- Approval of a rural water heater marketing campaign
- Data on residential buildings and input on plans for a study to characterize the region's housing stock
- Feedback on the scope, budget and analysis of the Commercial Energy Metering Study
- Advice for the Regional Emerging Technical Advisory Committee on changes to better meet the needs of the region in response to changing policy and grid needs and service to underserved groups

APPENDIX 1: Total organization results

This appendix provides information on Energy Trust's energy savings and renewable generation results as well as revenue and expenditures for programs beyond its core electric and gas efficiency and renewable energy programs under Energy Trust's grant agreement with the Oregon Public Utility Commission. Many of these programs will help Energy Trust reach more customers and will result in energy savings and generation; programs that deliver reportable savings and generation results may be funded by multiple sources, including funding received under the OPUC grant agreement.

I Activity highlights

Highlights of this work for 2022 include:

- Energy Trust **launched the Landlord Provided Cooling Space Initiative to provide vulnerable residents with heat relief**. Funded through a contract with Oregon Department of Energy, the initiative provides incentives for landlords to create cooling spaces for multifamily residents including at tribal housing, affordable housing, senior housing, agricultural workforce housing, manufactured home parks and other properties. Seven projects were approved to receive incentives in 2022 (incentives were available for equipment purchased after June 1, 2022).

- As program administrator, **Energy Trust supported expansion of the Oregon Community Solar Program** to a total authorized capacity of 160 megawatts. The amount of operational project capacity has nearly tripled from six projects totaling 9.1 MW in 2021 to 19 projects totaling 25.2 MW at the end of 2022. Energy Trust staff serves as the primary resource for projects and participants engaged in the program, managing project approvals, participant verification, customer inquiries and complaints, and the program disciplinary process, among other core program elements.

- Energy Trust is supporting Solar Ambassadors, a pilot in the Portland area to **remove barriers for people of color to access solar energy at home**. The pilot has funding from the National Renewable Energy Lab and was co-created with nonprofits African American Alliance for Homeownership and Verde. Thus far the team has developed a list of resources to help homeowners of color access solar energy with step-by-step directions and answers to frequently asked questions.

- Energy Trust is supporting Solar with Justice, a national effort led by the Clean Energy States Alliance to **develop solar energy in low- and moderate-income communities**. Staff wrote a case study detailing lessons learned from work with community groups on solar. Staff also distributed a national survey to community groups to learn about their work with solar projects and how state energy agencies can help.

- Energy Trust **completed a three-year targeted load management pilot with NW Natural** in Creswell and Cottage Grove. Using higher incentive offers – in the final phase, incentives were based on a localized avoided cost value -- and targeted marketing and outreach, the pilot achieved higher residential project installation rates, higher savings and higher peak savings than the baseline.

    - Targeted load management aims to change how and when customers use energy, reducing demand during periods of peak energy use and helping utilities avoid disruptive and costly infrastructure upgrades.

    - Also in 2022, staff began planning efforts with PGE and Pacific Power to determine how Energy Trust's experience with targeted load management could apply to the non-wires solution concepts proposed in their recent distribution system plan filings.

- Energy Trust completed its second year as **implementation partner for PGE's Smart Battery Pilot**. Due to supply chain disruptions early in the pandemic, battery storage system installations were slower

than anticipated, causing slower payment of rebates to trade ally contractors; in 2022, supply chain issues began to alleviate, and the number of project completions increased. Energy Trust supported PGE in redesigning bill credits and rebates for the second half of the pilot in response to customer and contractor feedback.

- Separately, Energy Trust contracted with PGE to support its Smart Inverter Pilot **to assess the capability of solar smart inverters to support utility planning and operations**. Energy Trust provided program planning and subject matter expertise during the development phase and will administer customer incentives during the implementation, slated for 2023 and 2024.
- Energy Trust applied for funding for a new project called Solar Energy Resilience for Vulnerable Communities (SERV). Funded by FEMA through Oregon's Office of Emergency Management, the project would involve Energy Trust working with community leaders on **planning and feasibility work for solar microgrid resilience projects**.
- Energy Trust is supporting Smart Grid Advanced Load Management & Optimized Neighborhood (SALMON), a collaborative effort with PGE and other partners to **install distributed energy resources in North Portland homes**, funded by a U.S. Department of Energy grant. In 2022, Energy Trust hired a program manager for this work, completed contracting with PGE, initiated a market assessment and attended a U.S. DOE grant kickoff event to connect with other awardees.
- **Other work reflected in this appendix** includes activity in NW Natural service area in Southwest Washington. Energy Trust also receives revenue from investments and spends money on business development.

II Revenues and expenditures tables

A. Total organization revenues

Source		Annual actual revenues		Annual budgeted revenues	Budget variance
OPUC grant agreement	$	202,296,131	$	199,755,933	1%
NW Natural for Washington	$	3,150,874	$	3,150,874	0%
Cooling Space Initiative (Oregon DOE contract)	$	141,175	$	-	N/A
NW Natural for TLM	$	429,464	$	214,732	100%
Oregon Community Solar Program (contract)	$	433,898	$	500,000	-13%
PGE Smart Battery Pilot (contract)	$	119,168	$	501,954	-76%
PGE Smart Inverter Pilot (contract)	$	21,284	$	-	N/A
SALMON (US DOE grant)	$	73,128	$	-	N/A
SERV (FEMA grant)	$	-	$	-	N/A
Solar Ambassadors (NREL grant)	$	88,000	$	-	N/A
Solar with Justice (US DOE grant)	$	3,509	$	-	N/A
Investments	$	420,345	$	208,000	102%
Total	**$**	**207,176,975**	**$**	**204,331,493**	**1%**

B. Total organization expenditures

Source		Annual actual expenditures		Annual budgeted expenditures	Budget variance
OPUC grant agreement	$	178,011,245	$	215,344,082	-17%
NW Natural for Washington	$	3,315,463	$	2,979,668	11%
Cooling Space Initiative (Oregon DOE contract)	$	141,176	$	-	N/A
NW Natural for TLM	$	161,932	$	363,693	-55%
Oregon Community Solar Program (contract)	$	318,899	$	384,907	-17%
PGE Smart Battery Pilot (contract)	$	118,956	$	465,224	-74%
PGE Smart Inverter Pilot (contract)	$	14,189	$	-	N/A
SALMON (US DOE grant)	$	70,827	$	-	N/A
SERV (FEMA grant)	$	9,411	$	-	N/A
Solar Ambassadors (NREL grant)	$	64,816	$	-	N/A
Solar with Justice (US DOE grant)	$	3,113	$	-	N/A
Business development	$	20,574	$	-	N/A
Total	**$**	**182,250,601**	**$**	**219,537,575**	**-17%**

C. Total organization expenditures by activity

			Annual actual expenditures		Annual budgeted expenditures	Budget variance
	OPUC grant agreement	**$**	**167,303,103**	**$**	**203,992,095**	-18%
Other	NW Natural for Washington	$	3,116,024	$	2,822,593	10%
	Cooling Space Initiative (Oregon DOE contract)	$	132,918	$	-	N/A
	NW Natural for TLM	$	152,191	$	344,520	-56%
	Oregon Community Solar Program (contract)	$	299,716	$	364,617	-18%
	PGE Smart Battery Pilot (contract)	$	111,801	$	440,699	-75%
	PGE Smart Inverter Pilot (contract)	$	13,336	$	-	N/A
	SALMON (US DOE grant)	$	66,567	$	-	N/A
	SERV (FEMA grant)	$	8,844	$	-	N/A
	Solar Ambassadors (NREL grant)	$	60,917	$	-	N/A
	Solar with Justice (US DOE grant)	$	2,925	$	-	N/A
	Business development	$	20,574	$	-	N/A
	Other Total	**$**	**3,985,812**	**$**	**3,972,430**	**0%**
	Administration	**$**	**10,961,686**	**$**	**11,573,049**	**-5%**
	Total expenditures	**$**	**182,250,601**	**$**	**219,537,575**	**-17%**

III Savings and generation tables

A. Total organization savings and generation by fuel

	Annual savings/generation	Annual goal	Percent Achieved
Electric savings	46.8 aMW	50.6 aMW	92%
Natural gas savings	6,338,558 therms	7,584,144 therms	84%
Electric generation	5.93 aMW	4.10 aMW	145%

B. Total organization progress toward annual efficiency goals by utility

	Annual savings	Levelized cost	Annual goal	Percent achieved YTD	Annual IRP target	Percent achieved YTD
Portland General Electric	30.4 aMW	2.8 ¢ per kWh	29.0 aMW	105%	24.8 aMW	122%
Pacific Power	16.4 aMW	3.9 ¢ per kWh	21.5 aMW	76%	18.7 aMW	87%
NW Natural	5,079,014 therms	48.9 ¢ per therm	5,853,279 therms	87%	6,062,451 therms	84%
Cascade Natural Gas	508,067 therms	56.0 ¢ per therm	752,829 therms	67%	485,188 therms	105%
Avista	355,763 therms	48.6 ¢ per therm	659,313 therms	54%	447,273 therms	80%
NW Natural Washington	395,714 therms	63.6 ¢ per therm	318,722 therms	124%	354,000 therms	112%

C. Total organization renewable energy generation by utility

	Annual generation aMW	Annual goal aMW	Percent achieved YTD
Portland General Electric	3.71	2.29	162%
Pacific Power	2.22	1.80	123%
Total	**5.93**	**4.10**	**145%**

APPENDIX 2: Diversity, equity and inclusion

This appendix provides information on Energy Trust's work to engage and serve customers it has not been successful at reaching in the past – specifically people of color, people in rural parts of the state and people experiencing low or moderate incomes. It covers 2022 activities guided by Energy Trust's current Diversity, Equity and Inclusion Plan and the OPUC's 2022 performance measure on diversity, equity and inclusion. Updates on this work are included in Energy Trust's quarter two and annual reports to the Oregon Public Utility Commission and Energy Trust Board of Directors. Activities designed to reach these customers that fall outside the plan and performance measure are highlighted elsewhere in this report.

Energy Trust's current Diversity, Equity and Inclusion Plan was finalized in early 2022 and published on Energy Trust's website. It was developed with input from staff, advisory council and board members, stakeholders, utility staff, community-based partners, customers and contractors. Unlike previous DEI plans, which included goals and deadlines to meet those goals, this is a living document that will be updated based on community feedback and lessons learned. It does not have an end date.

The plan comes at a crucial time for Energy Trust. Five years since adopting its first DEI plan to promote equity in its programs and reach more underserved customers, the organization has made significant progress in certain areas. For instance, it met goals related to increasing residential program participation among people of color and completing more projects with BIPOC- and women-owned contracting businesses. Recruiting and hiring of staff members who identify as people of color has also increased in recent years, which was another goal of the previous plan.

But significant gaps in service remain. A 2022 survey of residential customers found White customers continue to receive the largest financial benefits and be the most aware of Energy Trust; homeowners continue to participate at higher rates than renters; and low-income customers are significantly less likely to be aware of Energy Trust. What's more, some of the groups Energy Trust has identified as priority customers were most likely to report being worried about their energy bills, indicating they stand to benefit the most from participating in Energy Trust offers.

The current DEI plan focuses on engaging with customers and communities so that their perspectives drive program design and operational changes within Energy Trust. It includes five goals, each with proposed metrics to track Energy Trust's progress toward achieving these goals (descriptions of each goal, desired outcomes and all proposed metrics are available at energytrust.org/diversity):

1. Increase representation and readiness
2. Shift and sharing leadership and power
3. Increase community capacity and investments in BIPOC, low-income and rural communities
4. Increase transparency and accountability
5. Deepen engagement with people of color, low-income and rural communities

Community feedback

A first step in implementing the plan was getting feedback on the proposed metrics as indicators of success and whether the DEI Plan as written would focus Energy Trust activities in meaningful areas that serve more customers and communities. Staff held engagement sessions in the fall with representatives from 20 groups:

- An in-person session with community-based organizations in the Portland area plus a one-on-one session with a Portland-based nonprofit serving people with low income
- A virtual session with community-based organizations working outside of Portland and in rural parts of Oregon
- A virtual session with Energy Trust's Tribal Working Group that is made up of tribal members
- One-on-one sessions with three workforce development groups that work with contractors and tradespeople of color

Four major themes emerged from these engagements.

Partnerships and collaboration Session participants stressed that Energy Trust can't just market its offers and services, it has to interact with people in ways that are accessible and applicable to the community in order to build trust (feedback received at the Portland session). They encouraged Energy Trust to continue to partner with community-based organizations, specifically those that serve people experiencing lower incomes and culturally specific community-based organizations that engage young people (Portland). These organizations have insights and deep connections with their communities (rural). Given capacity constraints, community partners often need financial support from Energy Trust to engage in a meaningful way that ultimately boosts program participation (Portland). In addition to financial support, Energy Trust can further support community partners by developing content and curriculum on clean energy concepts as resources.

Overall, the DEI plan needs more details specific to tribes (tribal). Housing authorities can be a valuable partner to reach residential tribal customers and identify homes that are eligible for programs. Each tribe and its housing authority have different needs and resources, so Energy Trust should build on existing relationships to better understand those unique needs (tribal).

Removing barriers Some potential customers may feel reluctant to engage with Energy Trust offers and services when they find the available information to be confusing or when it takes too much time to learn about all the options (tribal, Portland). Energy Trust should hold listening sessions to learn about what communities know and do not know and learn how Energy Trust can communicate more clearly to communities about clean energy (Portland).

Barriers to receiving Energy Trust services seem to be less prominent in White communities. Outreach needs to be designed to reach more communities of color and people with low income (rural). Information must be available in Spanish (Portland, rural).

Diversifying contractor network Education should be a focus and a more tangible part of the plan. There are contractors and individuals who want to get into the clean energy space but need resources and support to make the transition (workforce).

Requiring businesses to be certified by the state's Certification Office for Business Inclusion and Diversity (COBID) should not be the main indicator or an indicator at all to measure success in the plan. The requirements to get certified do not align with the goal of representing a variety of perspectives and approaches in owning and supporting diverse businesses (workforce). Instead, the focus should be helping businesses owned by women, people of color and service-disabled veterans get COBID certification-ready (Portland). Additionally, providing a self-identification pathway for trade allies who can't or don't obtain COBID certification would benefit many businesses owned by people of color, especially Latinos (workforce).

Indicators of success Participants suggested Energy Trust collect data on growth among businesses that receive Energy Trust support to demonstrate the impact on their business development (Portland) and tracking the ownership and size of businesses that participate (workforce). Additionally, there should be a metric on investments in business development, such as worker training, scholarships or other support that helps a business grow (workforce). Last, they suggested there should be a metric related to Energy Trust's internal hiring and staffing (Portland).

Next steps

Informed by this feedback, Energy Trust staff will update the metrics in the DEI Plan in 2023. Once the metrics have been updated, staff will work with internal and external stakeholders to determine which indicators are most beneficial to begin tracking and reporting on in 2023.

Energy Trust staff will continue to capture and share insights from community engagements on an ongoing basis to inform program and organizational planning.

APPENDIX 3: Customer satisfaction results

This appendix provides results of Energy Trust's customer satisfaction surveys. Minimum satisfaction rates are set by the Oregon Public Utility Commission in Energy Trust's annual performance measures.

Energy Trust calculated customer satisfaction from short web and telephone surveys with randomly selected 2022 program participants within about two months of project completion. The survey asked residential and non-residential participants in Oregon about satisfaction with their overall experience with Energy Trust. Participants in the Existing Buildings (including existing multifamily), Production Efficiency and commercial solar programs were also asked about satisfaction with their interactions with program representatives. Surveys were conducted with 743 residential customers and 730 non-residential customers in Oregon who received an incentive or discount from Energy Trust in 2022. The average proportion of program participants satisfied with their overall experience with Energy Trust was 94% and satisfaction with Energy Trust program representatives was 94%.

Energy Trust's customer feedback survey does not ask residential participants about satisfaction with program representatives. Residential participants interact with Energy Trust representatives to a varying degree and many do not interact with a program representative. In general, commercial and industrial participants have more interaction with Energy Trust representatives.

New Buildings projects often involve numerous market actors (architects, engineers, developers and owners) at different project stages, so it is difficult to reach a project representative who is able to respond to questions about satisfaction. Satisfaction with the New Buildings program is obtained from interviews with program participants as part of a separate evaluation survey. The most recent survey took place in Q3 2022. Ninety New Buildings project owners or representatives who participated in 2021 and 2022 were surveyed about their overall program satisfaction and satisfaction with interactions with program representatives. Of participants surveyed, 100% were satisfied with their overall program experience. Satisfaction with program representatives was 100%.

Table 1: 2022 overall satisfaction

Program	Satisfaction with overall experience
Existing Buildings (including multifamily)	94%
New Buildings[31]	100%
Production Efficiency	95%
Residential	93%
Solar (residential and commercial)	89%
Unweighted average	**94%**

[31] New Buildings satisfaction based on survey results of 2021 and 2022 program participants

Table 2: 2022 satisfaction with program representatives

Program	Satisfaction with program representative
Existing Buildings (including multifamily)	94%
New Buildings[32]	100%
Production Efficiency	94%
Commercial solar	84%
Unweighted average	**94%**

[32] New Buildings satisfaction based on survey results of 2021 and 2022 program participants.

APPENDIX 4: Progress to 2020-2024 Strategic Plan

This appendix provides updates on Energy Trust's 2020-2024 Strategic Plan, which defines the organization's areas of focus and key strategies for the five-year period. These focus areas align with Energy Trust's purpose, which is to help customers and communities reduce costs and realize additional benefits by saving energy and using renewable resources. The board-approved strategic plan was developed through a public process that involved gathering input from the OPUC, utility partners, stakeholders, advisory councils and members of the public. This appendix provides updates on activities for each focus area and related progress indicators. The strategic plan and related information are available at energytrust.org/strategicplan.

Key

On track	On track, managing	Off track

Focus Area 1: Services to customers

We engage customers with relevant programs, information and services, including information and services specifically for underserved customers. We know we are making progress to this focus area when we achieve the following progress indicators:

Progress Indicator	Status as of Year 3
We achieve our annual savings and generation goals, and continue to use multi-year planning processes to identify ambitious longer-term energy targets that incorporate emerging sources of savings.	

- Energy Trust fell short of its 2022 annual goals for electric (at 92% of goal) and natural gas efficiency (82% of goal) but exceeded goal for renewable energy generation (145% of goal).
    - Since 2020, Energy Trust has achieved its annual electric savings goal once, exceeded its annual gas savings goal twice and exceeded its annual generation goal three times; the COVID-19 pandemic and related market conditions have negatively impacted energy savings activity.
    - Gas savings goals in 2022 were increased in collaboration with natural gas utilities to support their greenhouse gas reduction targets. For similar purposes, Energy Trust will design new programs for gas customers on interruptible and transport schedules starting in 2023.
- In 2022, Energy Trust implemented improvements to its planning and budgeting processes, including earlier and deeper stakeholder engagement and increased coordination with utility partners that identified emerging sources of savings and priority areas for Energy Trust investment.
- Energy Trust has created a communities and new initiatives sector to support comprehensive energy solutions that cross multiple efficiency and renewable energy sectors and will better serve community entities.

Progress Indicator	Status as of Year 3
We meet or exceed the goals we establish to increase the diversity of program participants.	

- Energy Trust did not have specific goals in 2022 regarding the diversity of program participants as it did in 2020 and 2021. Instead, as outlined in Energy Trust's 2022 Diversity, Equity and Inclusion Plan, staff hosted a series of community engagements to gather feedback on activities and measures of progress around Energy Trust's DEI work. For more information, see Appendix 2.
- Even without formal participation goals, staff devoted significant time and resources toward reaching and serving customer groups that have been historically underserved, including people of color, people with low incomes and people in rural areas.
    - The residential sector launched a no-cost ductless heat pump pilot that was developed with and will be delivered by community-based partners; the pilot seeks to identify and serve customers with high energy burdens and reduce their costs while making their homes more comfortable.
    - The commercial sector introduced higher incentive offers for small businesses and tailored development services for trade ally businesses that are certified by Oregon's Certification Office for Business Inclusion and Diversity (COBID) or eligible for certification.
    - The renewables sector met a new requirement to invest at least 25% of ratepayer funds collected for renewable energy in activities and projects that benefit customers with low or moderate incomes.
    - Outreach staff formed the Tribal Working Group with representatives from the Klamath and Modoc tribes, the Confederated Tribes of Umatilla Indian Reservation, Confederated Tribes of Warm Springs and Confederated Tribes of Grand Ronde. They provide input on how Energy Trust can shape programs to attract more participation, provide greater benefits specific to tribal needs, and support tribes' activities around energy planning, infrastructure, economic development, climate adaptation and resiliency.

Focus Area 2: Supporting utilities

We strengthen the value we deliver to customers by linking energy efficiency and renewable energy to the approaches utilities are using to meet changing customer energy needs. We know we are making progress to this focus area when we achieve the following progress indicators:

Progress Indicator	Status as of Year 3
We develop a framework to value, deliver, report and evaluate energy efficiency and renewable energy resource opportunities in targeted locations in collaboration with utilities.	

- In 2022, staff began planning efforts with PGE and Pacific Power to determine how Energy Trust's experience with targeted load management could apply to the non-wires solution concepts proposed in their recent distribution system plan filings.
- Energy Trust is supporting Smart Grid Advanced Load Management & Optimized Neighborhood (SALMON), a collaborative effort with PGE and other partners to install distributed energy resources in North Portland homes, funded by a U.S. Department of Energy grant.

- Energy Trust created the new communities and new initiatives sector that will work with utility partners to develop strategies and offers to support their objectives such as carbon reduction, grid flexibility, non-wires solutions and distribution system planning.

Progress Indicator	Status as of Year 3
We implement and evaluate initiatives designed to drive customer adoption of energy efficiency and renewable energy projects in targeted areas.	

- Energy Trust completed a three-year targeted load management pilot with NW Natural in Creswell and Cottage Grove. Using higher incentive offers – in the final phase, incentives were based on a localized avoided cost value -- and targeted marketing and outreach, the pilot achieved higher residential project installation rates, higher savings and higher peak savings than the baseline.

Focus Area 3: Informing policymakers

We provide objective information and analyses to policymakers and implementers to support development and implementation of energy policies. We know we are making progress to this focus area when we achieve the following progress indicator:

Progress Indicator	Status as of Year 3
We establish a system for monitoring regulatory and policy initiatives. We contribute data analyses and technical expertise during policy development and participate in policy implementation when there is potential customer benefit related to energy efficiency and renewable energy.	

- Staff supported and provided input to OPUC staff in preparing to develop equity performance measures to ensure environmental justice communities benefit from Energy Trust's investments of ratepayer funds.
- Staff provided information to the legislature's Task Force on Resilient, Efficient Buildings that studied and proposed policy recommendations to the legislative body on ways to reduce emissions from new and existing residential and commercial buildings.
- Staff supported local governments that have passed or are developing climate or energy action plans that involve energy efficiency and renewable energy, including the City of Salem.
- Staff coordinated and shared information with Oregon's Department of Energy, Department of Environmental Quality and Housing and Community Services on new programs focused on indoor temperature control, resiliency, renewable energy, greenhouse gas emissions and wildfire rebuilding.
- Staff revised an internal policy monitoring system that was developed in 2020.

Focus Area 4: Delivering multiple benefits

We maximize the effectiveness and reach of public purpose charge funding by leveraging additional funding to advance clean energy investments that deliver multiple benefits. We know we are making progress to this focus area when we achieve the following progress indicators:

Progress Indicator	Status as of Year 3
We acquire more energy savings and renewable generation than would otherwise be achieved with only public purpose charge funding.	

- Through a contract to administer Oregon Community Solar Program, Energy Trust has supported the development and growth of the program, which allows customers whose homes are not suited for rooftop solar to benefit from solar energy.
- In 2022, Energy Trust created an Innovation and Development team that will cultivate strategic partnerships and pursue outside funding opportunities that support ratepayer funded activities and expand our ability to serve customers.

Progress Indicator	Status as of Year 3
We coordinate with more organizations and communities where their additional resources help accomplish mutually supportive objectives.	

- Energy Trust helped build capacity within community-based organizations to promote clean energy resources – including Energy Trust offers and information for customers – by awarding small Working Together Grants to nonprofits. Grant activities funded in 2022 included development of a clean energy education program for communities of color, training for clean energy community navigators and including Energy Trust information in outreach activities.

Progress Indicator	Status as of Year 3
We establish a concept agreement with the Oregon Public Utility Commission and at least one natural gas utility to assess a joint carbon reduction effort.	

- Community-specific collaboration with one natural gas utility did not move into implementation phase.
- Energy Trust is continuing efforts with all gas utility partners to support activities that reduce greenhouse gases. This includes plans for a hybrid HVAC pilot starting in 2023 with electric heat pump incentives for customers with existing gas furnaces to explore the feasibility and savings opportunities of hybrid HVAC systems.
- Staff entered into agreements and made plans to deliver new programs with gas utilities to serve customers on interruptible and transport schedules starting in 2023.

Focus Area 5: Adapting to change

We enhance our ability to quickly and effectively respond to changes, needs and new opportunities. We know we are making progress to this focus area when we achieve the following progress indicators:

Progress Indicator	Status as of Year 3
We achieve diversity, equity and inclusion goals for employee hiring and recruitment and for the board of directors.	

- Energy Trust met goals under its previous Diversity, Equity and Inclusion Plan related to staffing, increasing the percentage of applicants and new hires who identify as people of color.
- While a board ad hoc DEI committee has not defined metrics for the board, the committee has begun holding regular trainings and developed a diversity, equity and inclusion training plan for the board.
- In 2022, Energy Trust added four board members and prioritized racial and geographic diversity in the recruiting process.

Progress Indicator	Status as of Year 3
Annual surveys indicate that staff is significantly aware of how annual goal setting, business planning and prioritization enables flexible resourcing of existing and new initiatives.	

- Energy Trust surveys staff every six months to assess progress toward enhancing organizational flexibility, adaptability and responsiveness to change and new opportunities. Results in 2022 indicated strong alignment around common goals and priorities, improved decision-making capabilities and willingness to explore innovative new ideas; however, balancing workloads as staff take on new projects and priorities remains a challenge.
- As an outcome of the business planning process, Energy Trust created a multi-year staffing plan, anticipating increased demand for core services and additional capacity needed to take on new initiatives and pursue innovative new opportunities to meet stakeholder expectations. Additional staff positions are accounted for in the 2023 budget and 2024 projection.
    - Energy Trust formed an Innovation and Development team focused on exploring new ideas and leveraging new funding sources to bring more clean energy benefits to more customers.
    - Energy Trust formed a communities and new initiatives sector focused on serving customers with integrated offerings spanning multiple sectors.
- Energy Trust conducted Learning Lab, a six-month process to test new tools and methods to improve and support team functioning, engagement and communications amid virtual and hybrid work environments. A survey at the end of the process showed increased comfort with virtual work among staff and improved communication, collaboration and meeting productivity.

APPENDIX 5: Renewable resource development targets

This appendix provides information on Energy Trust's project development assistance for projects that would generate renewable electricity from hydropower, biopower, municipally owned community-scale wind and geothermal resources.

The primary purpose of project development assistance is to increase the number of distributed renewable energy generation projects in Oregon by lowering early-stage development barriers and financial risk. Through project development assistance, Energy Trust builds a pipeline of potential projects that have achieved critical pre-construction activities, including technical and financial assessments. Development assistance also prepares proposed project owners to apply for Energy Trust installation incentives and other sources of financial support. The early-stage analyses delivered through development assistance, such as feasibility studies, build and reinforce Energy Trust's awareness of market factors and other considerations important for supporting distributed renewable energy resources while helping individual projects leverage other incentives, construction services and long-term financing.

Applications for project development assistance must be received and approved by Energy Trust prior to the start of the proposed development activity. Project development assistance incentive funds are provided as a reimbursement following completion of the activity and proof of full payment to all contractors. Incentive funding typically equates to 50% of the project activity cost, up to a maximum of $200,000 per project. Project proponents have a significant financial stake in development activities, helping ensure that activities are necessary and fiscally prudent. Common examples of project development activities include feasibility and design studies, feedstock studies, irrigation district modernization technical investigations and assessments, and transmission and interconnection studies. In addition to this assistance, Energy Trust project development assistance funding supports regional energy planning and energy resilience investigations.

While project proponents using any eligible technology may apply for project development assistance incentives, staff focus most outreach efforts in two key areas:

- Electricity generation from the combustion of biogas, which is produced from the anaerobic digestion of organic material (i.e., wastewater sludge, fat/oils/grease, food processing material) at water resource recovery facilities.
- Hydroelectric projects made possible from the modernization (i.e., piping) of irrigation water delivery infrastructure (canals, ditches and laterals) by irrigation districts.

Barriers to project development

Energy Trust's project development assistance incentive offer is designed to address development barriers and challenges. In 2022, lingering impacts on the supply chain from the pandemic, low avoided power prices and record high inflation presented market headwinds for hydropower and biopower. These barriers were present for some development assistance activities, slowing customer decision making and executing of feasibility studies.

The following summarizes barriers encountered in 2022:

- **Market conditions for distributed renewable energy generation in Oregon continue to be challenging.** At all stages of the development process, project owners face poor market fundamentals, including persistent low avoided cost rates and high inflation causing increasing material, labor and consulting services costs. This has led to a long-term chilling effect for custom renewable energy project development. Utility interconnection for small-scale renewables continues to be time consuming and

increasingly costly. This continues to reinforce project development assistance as an essential tool to attract investment in distributed energy resources.

- **Early-stage development capital is scarce and high risk.** Investing financial resources in renewable energy project development with above-market costs is often regarded as high risk. Investors are reluctant to commit funds into projects with unclear technical or financial viability, especially when a project is likely to have a lengthy return on investment. Without early-stage funding, a project cannot advance to the point where the risk is reduced. By providing early-stage funding, Energy Trust builds a pipeline and helps move projects forward, enabling them to attract additional financing and decide to proceed with construction. On the other hand, early-stage assessments may also help inform the market if a project is determined to not be technically or financially viable. Energy Trust helps project owners reach that point with less financial exposure.
- **Project proponents whose primary business is not energy often encounter difficulties navigating the stages of project development.** Energy Trust works with many project proponents (e.g., municipalities, private businesses, irrigation districts) that are not professional energy developers. Advancing a project through resource characterization, feasibility assessment, financing, permitting and interconnection can be lengthy and difficult. Project development assistance – both financial and technical – helps project proponents navigate these steps in less time and at a lower cost.

Project development assistance activity in 2022 relative to the OPUC performance metric

This report details the specific uses of project development assistance in these areas in 2022. Since 2014, Energy Trust has focused on increasing the deployment of project development assistance incentives to build a pipeline of projects that can apply for installation incentive funds.

Summary of project development assistance activity in 2022

Focus areas	Projects in pipeline	Total funds spent in 2022
Focus area 1: Biogas	5	$403,663
Focus area 2: Irrigation hydropower	13	$283,501
Outside focus areas	12	$345,526
Total	30	$1,032,690

The 2022 OPUC performance measures for Energy Trust include the following metrics related to project development assistance:

> *For project and market development assistance (part 1), deploy at least $1.5 million in non-solar project development assistance incentives. Maintain a non-solar project development assistance pipeline in excess of 25 projects. Report number of projects served total dollars spent, and summarize project progress through development stages.*

In 2022, the Other Renewables program spent $1,032,690 in non-solar project development assistance incentives. About 27% of funds spent involved support for irrigation districts enrolled in irrigation modernization and about 39% involved support for organic material recovery investigations and an organic material processing design project. The program served 30 projects in 2022, exceeding the benchmark for maintaining a pipeline of non-solar project development assistance incentives.

Spending in 2022 was lower than forecasted for several reasons:

- High inflation caused significant increases in projected capital cost estimates.
- Concerns among municipalities about the financial impacts from projects on utility rates during a period of high inflation led to projects deprioritized or postponed.
- New district enrollment in the irrigation modernization program did not materialize for two districts due to decision-making delays. Also, forecasted spending on irrigation modernization was lower in 2022 than realized due to capacity issues and slower decision-making. However, two new irrigation districts were enrolled at the end of 2022 with significant spending forecast for 2023.

In 2022, project development assistance supported community strategic energy planning for Wallowa County and for phase one of a study investigating how an irrigation hydropower system could provide a back-up power supply for municipal critical facilities in the instance of a public safety power shut off or an electric grid failure resulting from a natural disaster.

Following is a description of project development activities in 2022 in detail.

Focus area: Electricity generation from biogas

Biogas projects supported: 5

Milestones met:

- Municipal water resource recovery facility biogas use alternatives analysis
- Municipal water resource recovery facility utility grade metering
- Municipal organic material recovery feasibility assessments
- Municipal post-commercial food waste processing design

Oregon's businesses and municipalities are obligated to manage and safely dispose of significant volumes of organic material. As Oregon's population grows, the volume of organic material requiring processing and disposal increases as well. Organic material, produced by food processors, breweries, and municipal water resource recovery facilities, are costly to manage and transport and if not disposed of properly will pose human health risks. Traditional methods of safely managing these materials include land application and landfilling, and in the case of food waste, conveyance to livestock operations.

With recent technological advancements, these materials can serve as a valuable biogas feedstock. Biogas, about 60% methane by volume, is a well-recognized renewable energy resource that can be combusted to serve onsite thermal energy needs, used as a fuel for combined heat and power systems (cogeneration), or conditioned further and compressed for vehicle fuel or injected into existing natural gas pipelines as renewable natural gas.

In 2022, Energy Trust provided project development assistance to municipalities that are assessing organic material recovery and bioenergy feasibility options that would yield significant renewable energy generation, resource management and non-energy benefits.

Focus area: Irrigation hydropower

Irrigation modernization projects supported: 13

Milestones met:

- Evaluation of existing water use and infrastructure
- Stakeholder engagement
- Evaluation of water savings and energy conservation potential
- Evaluation of environmental benefits and water quality impacts

- Evaluation of hydroelectric potential
- Evaluation of economic impacts
- Development of watershed and system optimization plans

Energy Trust supports several types of irrigation hydropower projects, which are categorized by customer type and process used. Staff see technically and financially viable hydropower opportunities among irrigation districts, other agricultural water suppliers such as ditch companies, and farms where irrigation water is delivered to an individual user. Energy Trust's irrigation modernization work provides a comprehensive structure for irrigation districts and other agricultural water suppliers to assess hydropower potential and identify additional water delivery system improvements and benefits.

Much of Oregon's agricultural water is delivered to farms by irrigation districts or other water providers using aging, open canal systems. The conveyances were typically constructed more than 120 years ago, which lose significant quantities of water to seepage and evaporation. They are ripe for modernization, which would derive lasting energy and water conservation benefits, and create additional opportunities for agricultural security, rural prosperity, drought resiliency and environmental improvements.

Hydropower projects using irrigation water have been a focus for Energy Trust since 2010. Despite challenging renewable energy market conditions, these types of projects remain viable due to the wide range of non-energy benefits that modernized irrigation systems can provide, substantial grants from state and federal agencies to offset the cost of piping and the concerted efforts by irrigation district managers and agricultural producers.

Modernizing an irrigation district is complex. A significant modernization milestone is the replacement of open canals with pipes, which saves water by eliminating seepage and evaporation. Irrigation canals use gravity to keep water flowing. Once the open system of canals and laterals are piped, the water in the pipe is pressurized by gravity, allowing irrigators to remove the pumps they formerly needed to lift and convey water to crops, thereby reducing energy use and maintenance costs. Pressurized water may also enable additional upgrades to more water-efficient on-farm irrigation systems. Surplus water pressure can be used to generate hydropower, with revenues from the sale of renewable electricity helping to finance project implementation.

The Irrigation Modernization Program provides irrigation districts and the farmers they serve a one-stop shop to navigate complex agricultural priorities, regulatory requirements, funding needs and environmental concerns. Within each district, the irrigation modernization initiative identifies short- and long-term irrigation goals, assesses opportunities and risks, identifies potential stakeholder partnerships, evaluates and communicates the associated energy, economic, ecological and social benefits of modernization, secures project financing and facilitates project implementation.

This nationally recognized effort reduces the cost and time required for project planning and implementation, addresses key regulatory and institutional barriers, leverages federal, state and private funding, and reduces costs for agency, environmental and agricultural program deployment. This initiative builds awareness that modern agricultural water management can help mitigate the impacts of long-term drought on agricultural production and regional watersheds and ecosystems. Irrigation modernization is replicable and scalable, designed to achieve significant energy, agricultural and ecosystem benefits in Oregon and other Western states.

In 2022, irrigation modernization assessments were underway at 17 Oregon irrigation districts. These assessments identify the renewable energy, energy efficiency, agricultural, water conservation, environmental and economic benefits associated with modernization. They also characterize various potential project implementation approaches. Each irrigation district will choose the implementation approach that is right for their patrons and unique situation. After a district's board selects a preferred approach, then design, permitting and financing will begin, followed by contracting and construction.

Project development assistance outside of focus areas

Projects supported: 12

Milestones met:

- Feasibility studies
- Design study
- Hydrologic assessments
- Study of hydropower potential at municipal pressure reduction valve sites
- Support for Wallowa County's energy planning process
- Renewable Energy Certification registration costs

Energy Trust supported 12 projects outside the two focus areas in 2022. These projects represent a wide variety of distributed renewable energy generation opportunities, including design of in-conduit hydropower, commercial wood processor biopower feasibility study, municipal water delivery system pressure reduction valve hydropower design and public fish hatchery hydropower design.

In addition, Energy Trust provided development assistance for a microgrid feasibility study that investigated how a conceptual irrigation district in-conduit hydropower facility could be designed to provide backup power to nearby public-owned critical facilities when grid power is lost. Also, development assistance was used to support the development of a community strategic energy plan in Wallowa County using a framework developed by the U.S. Department of Energy.

APPENDIX 6: NW Natural industrial demand-side management activities

Since 2009, Energy Trust has provided service to NW Natural's Schedule 31 and 32 non-transport customers, funded through a special rate adjustment mechanism rather than through the public purpose charge. Program costs and therm savings for these customers in 2022 are included in the body of this annual report as a portion of NW Natural savings and reported separately below.

		Annual savings therms		Annual actual expenditures	Levelized cost per therm
Commericial	Existing Buildings	795,719	$	3,141,323	44.6 ¢
	New Buildings	32,264	$	76,946	18.8 ¢
	Commercial total	**827,983**	**$**	**3,218,269**	**43.1 ¢**
Industrial	Production Efficiency	1,146,321	$	1,906,992	21.2 ¢
	Industrial total	**1,146,321**	**$**	**1,906,992**	**21.2 ¢**
	Total	**1,974,304**	**$**	**5,125,261**	**31.1 ¢**

APPENDIX 7: Purpose, goals and background

Purpose statement

We help customers and communities reduce costs and realize additional benefits by saving energy and using renewable resources.

Vision statement

Clean, affordable energy for everyone.

Background

Energy Trust is an independent 501c(3) nonprofit organization funded by and serving Oregon customers of Portland General Electric (PGE), Pacific Power, NW Natural, Cascade Natural Gas and Avista, and Washington customers of NW Natural. Since 2002, we have offered energy efficiency and renewable energy programs and services to customers and communities, including those who own or rent a home or building, product manufacturers, small and large businesses and industries, nonprofit and public organizations, farmers and ranchers.

We invest utility customer funds to deliver benefits from cost-effective energy-efficiency improvements, reduce the above-market costs of small-scale renewable energy generation systems with an emphasis on benefiting customers with low incomes, and support projects that improve the reliability and resiliency of the electric grid. We serve customers in coordination with utilities, community and industry organizations and government agencies. Our work helps ensure a more affordable and sustainable energy future for utility customers and contributes to our local and state economy in positive ways.

We provide information, technical expertise and financial assistance to help people modify their energy usage habits, choose high-efficiency products, invest in energy-efficient construction and install renewable energy projects. Our programs and approaches, range of offers tailored to customers, and collaboration with public agencies and community organizations enable us to provide relevant clean energy solutions as customer and community needs evolve. With our assistance, participating customers derive a range of benefits including lower energy bills, greater comfort, improved productivity and lower carbon emissions.

It is our responsibility to ensure all customers can directly benefit from our services, including people with low and moderate incomes, communities of color and rural communities. Since 2019, Energy Trust has developed annual diversity, equity and inclusion plans and goals to improve and enhance offerings for customers we have historically underserved.

As a steward of utility customer dollars, we consistently maintain low administrative and program support costs to ensure the majority of public purpose charges and ratepayer funds flow back to customers in the form of incentives, services and education. We competitively bid our program management and delivery contracts, ensuring competitively priced and effective services are provided. For most programs, Energy Trust leverages specialized local trade and program ally businesses – many of which employ 20 or fewer staff – that already serve customers in the marketplace. We support and leverage a statewide network of trade ally contractors, allied professionals and participating retailers that are familiar with Energy Trust incentives. By connecting customers directly to this network, Energy Trust helps keep costs low, supports our region’s energy services sector and sustains opportunities in the areas we serve.

We are led by an independent board of directors whose members volunteer their time and expertise. Our work is also shaped by advice from three advisory councils comprised of stakeholders and volunteers. We strive to be inclusive and transparent by holding open meetings and publishing online meeting agendas, notes, independent

third-party program evaluations, draft and final budgets and action plans, reports and annual audited financial statements.

We comply with legal requirements and minimum performance measures set forth in our contract with the Oregon Public Utility Commission. Annual goals for electric and natural gas energy savings are developed in consultation with PGE, Pacific Power, NW Natural, Cascade Natural Gas and Avista and built from each utility's Integrated Resource Plan. This collaboration enables Energy Trust to focus on and be accountable for delivering cost-effective energy to meet the needs of every utility customer. In addition, annual renewable energy generation goals are developed using market knowledge obtained through renewable resource assessments.

APPENDIX 8: Board of directors, board development guidelines; advisory councils and meetings

Board of directors

PRESIDENT—Henry Lorenzen, Pendleton, has a resume that spans working as a partner at Corey, Byler, Rew, Lorenzen and Hojem law firm to running his family's 4,000-acre wheat farm. From 2002 to 2018, he served on the Northwest Power and Conservation Council, which develops a regional power plan and fish and wildlife program. He also served on the Oregon State Board of Higher Education, Oregon Fish and Wildlife Commission and Oregon Environmental Quality Commission. Henry's education includes a law degree from Lewis & Clark Law School, a master's degree in business administration from Harvard University and a bachelor's degree in electrical engineering from Oregon State University. He is a certified professional electrical engineer. *Henry joined the board in October 2018 and became president in 2022.*

VICE PRESIDENT—Roland Risser, Washington County, has extensive knowledge of residential, commercial and industrial energy efficiency program design, development and implementation, including low-income energy efficiency programs. He worked at the U.S. Department of Energy as director of the Building Technologies Office and then deputy assistant secretary of Renewable Power. His decades of energy experience include multiple leadership positions at Pacific Gas and Electric and service on national boards for the American Council for an Energy-Efficient Economy and the Consortium for Energy Efficiency. Roland earned a master's degree in biology from California Polytechnic State University, a bachelor's degree in biology from the University of California at Irvine and graduated from the Haas School of Business at University of California at Berkeley. *Roland joined the board in October 2018 and became vice president in 2022.*

SECRETARY—Eric Hayes, Beaverton, is the state organizing coordinator for the International Brotherhood of Electrical Workers. He engages and organizes electrical workers to achieve better wages, pensions, insurance and training. Eric's roles include recording secretary, vice president and president of Local 48. Eric has also served as a trustee of the Edison Pension Trust, Harrison Health Trust and the Apprenticeship Trust. He was also president of the Electrical Minority Workers Caucus Portland Chapter, which promotes people of color and women in IBEW. *Eric joined the board in October 2018 and became secretary in 2022.*

TREASURER—Susan Brodahl, Portland, is a senior vice president in the Portland office of Heffernan Insurance Brokers as well as an owner of Heffernan Group, which has more than 400 employees and is ranked in the top tier of all privately held brokerages in the country. Susan believes in a creative approach to insurance using a risk funding model. She is a frequent featured speaker at regional and national conventions and has been published in various trade and mainstream journals. She has a degree in economics from Willamette University. *Susan joined the board in February 2014 and became treasurer in 2018.*

Erik Andersson, Salem, is president of SEDCOR, or Strategic Economic Development Corporation, an economic development nonprofit with more than 450 members in Oregon's Mid-Willamette Valley. He previously served as economic development manager for Tacoma Public Utilities in Tacoma, Washington, where he developed the utility's first economic development strategic plan, and as economic development manager for Pacific Power. Erik served under former Oregon Gov. Ted Kulongoski as regional coordinator for economic revitalization in the Willamette Valley and central part of the Oregon Coast. He has a bachelor's degree in agricultural economics from Cornell University and a master's degree in business administration from McGill University. *Erik joined the board in February 2020 and stepped down in December 2022.*

Melissa Cribbins, Coos Bay, is an attorney and former Coos County Commissioner. Prior to her election in 2012, she worked for the Coquille Indian Tribe as in-house counsel for six years. She previously worked for the City of Spokane and Eugene Water and Electric Board in the field of water quality. She is a member of the Oregon State Bar, the Washington State Bar and is active in many organizations in Coos County and statewide. She is a

graduate of Portland State University and Gonzaga University. *Melissa joined the board in February 2014 and served as president from 2020 to 2022.*

Thelma Fleming, Vancouver, is a vice president and risk compliance audit professional with U.S. Bank in Portland. She brings 30 years of experience in banking, risk management, regulatory and tax compliance to the board. Thelma has a degree in business administration from Columbus State University and volunteers with Financial Beginnings Oregon, which offers financial literacy seminars to all ages. *Thelma joined the board in June 2022.*

Ernesto Fonseca, Portland, is the chief executive officer of Hacienda, an Oregon community development corporation and social enterprise that advances the livability, health and economic progress of underserved communities in the Pacific Northwest. He has dedicated his career to the development of high quality, affordable housing and social services in Mexico and the United States. Ernesto brings experience in community development, housing and energy access. He holds a master's degree in energy performance and climate responsive architecture and a doctorate in environmental design and planning from Arizona State University. *Ernesto joined the board in May 2018 and stepped down in December 2022.*

Lindsey Hardy, Bend, is the program director of the Bend Energy Challenge, a program of The Environmental Center. Before that, she was the outreach director at Sunlight Solar Energy. She sat on the steering committee of the High Desert branch of the Cascadia Green Building Council for three years and planned Central Oregon's Green and Solar Tour. As an AmeriCorps volunteer with the University of Oregon's Resource Assistance for Rural Environments, she oversaw the Solarize Pendleton campaign, helping neighborhoods benefit from efficiency of scale in residential solar installations. She has a bachelor's degree in environmental studies from Ithaca College. *Lindsey joined the board in May 2015 and stepped down in February 2022.*

Elee Jenn, Newberg, is principal marketing and business development manager at Energy Performance Engineering LLC in Newberg. She helps building owners construct and maintain high-performance energy-efficient facilities through system commissioning and building control services. Many of Energy Performance Engineering's clients are schools, colleges and governments, including Portland Community College in Newberg. An accredited Leadership in Energy and Environmental Design professional, Elee holds a master's degree in analytical chemistry and a bachelor's degree in chemistry. *Elee joined the board in October 2018 and stepped down in December 2022.*

Alexia Kelly, Hood River, works at the intersection of policy and finance to accelerate the transition to a zero-carbon economy. She has held leadership roles in government, nonprofits and the private sector, including as a senior climate change adviser and foreign service officer with the U.S. Department of State. At the State Department she led an initiative on low emissions development across more than 25 countries, 10 federal agencies and more than $800 million in climate change mitigation funding. She was previously a member of Energy Trust's Renewable Energy Advisory Council. Alexia has a bachelor's degree in planning, public policy and management and master's degrees in public administration and community and regional planning from the University of Oregon. *Alexia joined the board in February 2020 and stepped down in October 2022.*

Mark Kendall, Salem, has experience in energy management and renewable resource development in Oregon. Prior to founding his own consultancy, Kendall Energy, in 2009, he spent 19 years with the Oregon Department of Energy working in commercial and industrial energy management policy, including serving as the governor's appointee to the Northwest Energy Efficiency Alliance board from 2001 to 2006. Before working for the state, he spent 11 years with the Eugene Water and Electric Board. He also served on the Oregon Low Carbon Fuel Standard Advisory Committee and facilitated the 2009 Industrial Greenhouse Gas Reduction subcommittee of the Oregon Global Warming Commission. He received a bachelor's degree from Linfield College with an emphasis in communications and energy management and a master's degree in organizational development from the Leadership Institute of Seattle City University. *Mark joined the board in August 2012 and stepped down in February 2022.*

Alan Meyer, Salem, is a retired director of energy management for Weyerhaeuser Company, a diversified forest products manufacturing company. In that role, he was responsible for coordinating energy management activities at numerous manufacturing facilities throughout North America. Prior to joining Weyerhaeuser, he was director of energy for Willamette Industries, holding similar responsibilities. He also worked for PacifiCorp as the Oregon large industrial accounts manager. He previously served on the board of directors of Industrial Customers of Northwest Utilities, a nonprofit advocacy organization focused on energy policies. *Alan joined the board in September 2005 and stepped down in February 2022.*

Anne Haworth Root, Medford, is co-owner and general manager of EdenVale Winery and Eden Valley Orchards, a destination winery, historic pear orchard and events center in southeast Medford. A second tasting room, Enoteca, is located in Ashland. An award-winning entrepreneur, Anne developed the concept and helped found the 57 Oregon Wine and Farm Tour, an agritourism coalition of Southern Oregon wineries, historic farms and specialty food and cheese companies. She is a graduate of Southern Oregon University, where she was student body president and chair of the Oregon Student Lobby. She pursued postgraduate studies in the Master of Commerce program at Wollongong University in Australia. *Anne joined the board in December 2011.*

Silvia Tanner, Portland, brings years of experience in the utility regulation field to her board member position. Silvia is a senior energy policy and legal analyst at Multnomah County's Office of Sustainability where she focuses on clean energy and energy justice. She leads Multnomah County's advocacy for rules, regulations and utility practices that support vulnerable populations, and explores how seemingly neutral energy policies can contribute to unjust outcomes. She also spearheads the county's efforts to meet its community-wide renewable energy goals. She holds a law degree from Lewis and Clark Law School and a bachelor's degree in economics from Portland State University. *Silvia joined the board in February 2022.*

Peter Therkelsen, Ashland, is the deputy of the Building and Industrial Applications Department at the Lawrence Berkeley National Laboratory. His work focuses on industrial energy management business practices and policies. He studies barriers to the implementation of industrial energy efficiency measures, supports the implementation of energy management systems in the United States, and serves as a delegate of the United States at International Standards Organization meetings for energy management and savings. Peter studies and develops high efficiency, fuel flexible and low emission installed and portable heat and power systems. He holds a doctorate in mechanical engineering from the University of California, Irvine. *Peter joined the board in February 2022.*

Ellen Zuckerman, Portland, has worked across the country on demand side management program design, implementation, marketing, performance and policies. She started her energy-efficiency career in support of New York State's low-income weatherization program. As an independent energy consultant, she advised Fortune 500 companies, state agencies, local governments and nonprofits. Currently she manages Google's regulatory and legislative engagement on energy and climate issues in the Western U.S. and Latin America. She has a bachelor's degree in geosciences from Princeton University and a master's degree in environmental law and policy from Vermont Law School. *Ellen joined the board in November 2022.*

Ex-officio: Oregon Public Utility Commission

Letha Tawney, Portland, is one of three Oregon Public Utility Commissioners and was appointed by Gov. Kate Brown in June 2018. Prior to this, Letha worked for the World Resources Institute as an expert on clean energy development and large customer buying strategies. As the Polsky Chair for Renewable Energy, she led the institute's work on propelling innovation in business and regulatory models in the power sector. Now Letha represents Oregon on the Electricity and the Critical Infrastructure committees for the National Association of Regulatory Utility Commissioners. She also serves on the Energy Imbalance Market Board of State Regulators, engaging closely on Western electricity market development. Letha has a master's degree in public administration from the Harvard Kennedy School and a bachelor's degree in business and computer science from George Fox University. *Letha joined the board as ex-officio in October 2019.*

Special board adviser: Oregon Department of Energy

Janine Benner, Salem, is the director of the Oregon Department of Energy. She joined ODOE in 2017 as assistant director for planning and innovation and was later made director in February 2018. She provides leadership and policy direction to help the state shape an equitable clean energy transition, protect the environment and public health, and responsibly balance energy needs and impacts for current and future generations. Janine came to ODOE from the U.S. Department of Energy where she served as associate assistant secretary in the Office of Energy Efficiency and Renewable Energy, the largest government funder of clean energy research and development. Before that, she served as deputy assistant secretary in the department's Office of Congressional and Intergovernmental Affairs. Janine also spent 12 years working for U.S. Rep. Earl Blumenauer, first as an energy and environmental policy adviser and then as deputy chief of staff. She grew up in Portland and has a degree in history from Princeton University. *Janine joined the board as special board adviser in April 2017.*

Board development guidelines

Energy Trust's board of directors is a non-stakeholder, volunteer board. It oversees Energy Trust management, provides strategic and policy direction and approves the organization's budget and major expenditures. The board carries out its oversight role collectively and through several committees. The board's bylaws ensure Energy Trust board meetings and other processes are clear, open and accessible to the public.

The Oregon Public Utility Commission grant agreement with Energy Trust calls for the Energy Trust board to include the skills, broad representation and diversity necessary to achieve the nonprofit's purpose and vision. As board openings arise, the board consults community-based organizations, advisory councils, individuals and collaborating organizations to identify candidates with appropriate experience and knowledge of customers underserved by Energy Trust.

The 2022 board included voting members with background in business, private consulting, government, utilities, trades and nonprofits. Members are from Ashland, Bend, Coos Bay, Eugene, Hood River, Medford, Newberg, Pendleton, Salem and the Portland metropolitan area including Vancouver. The board's OPUC ex-officio member is OPUC Commissioner Letha Tawney. Janine Benner, director of the Oregon Department of Energy, has been a special board adviser since April 2017. The ex-officio and special board adviser are not voting members.

All voting board members complete and sign disclosure of economic interest forms each year. The OPUC ex-officio board member and the special adviser from the Oregon Department of Energy do not receive confidential information. Once a year, board and staff members participate in a planning session to review progress and discuss Energy Trust's strategic direction. Board members are supported to undertake ongoing development activities. In addition, board governance and fiduciary responsibility training is provided to new board members in orientation and to all board members in conjunction with the board's annual meetings.

Advisory councils and meetings

The board of directors conducts its work with the input from three advisory councils. The following lists of advisory council members reflect members who served during all or part of 2022. In addition to the council meetings detailed below, Energy Trust held a workshop on 2023 budget goals in October for all three councils that was open to the public. Meeting notes for all advisory council meetings are available at energytrust.org/about/public-meetings.

Conservation Advisory Council

Jeff Bissonnette, NW Energy Coalition
Andy Cameron, Oregon Department of Energy
Monica Cowlishaw, Cascade Natural Gas

Kari Greer, Pacific Power
Tim Hendricks, Building Owners and Managers Association
Tina Jayaweera, Northwest Power and Conservation Council
Anna Kim, Oregon Public Utility Commission
Margaret Lewis, Bonneville Power Administration
Lisa McGarity, Avista
Kerry Meade, Northwest Energy Efficiency Council
Tyler Pepple, Alliance of Western Energy Consumers
Laney Ralph, NW Natural
Becky Walker, Northwest Energy Efficiency Alliance
Jake Wise, Portland General Electric

2022 meeting dates	Major discussion topics
February 16	Preliminary 2021 results; contract bids for Residential and Production Efficiency programs; on-bill financing for Avista customers; measure development for 2022 and 2023; ductless heat pump cost-effectiveness exception from OPUC; member recruitment; legislative update.
April 12	Discussion of industry trends, customer needs and market barriers and opportunities to inform development of Energy Trust's 2023 budget.
May 11	Update on 2023 budget planning; quarter one results; customer fuel choice project; Residential program updates; business customer offer updates; New Buildings code alignment; ODOE activities and implementation of SB 1536.
June 29	Wildfire recovery incentives; discussion of rural customer needs, small business customers and residential programs to inform development of Energy Trust's 2023 budget.
September 14	Direct-install lighting pilot; New Buildings code alignment; 2023 budget update; year-end savings forecast; 2023 measure updates and proposed cost-effectiveness exceptions; utility-specific action plans; program management contract selections.
November 16	Existing Buildings community-based liaisons; OPUC performance measures on equity in 2023; 2023 meeting dates and member recruitment.

Diversity Advisory Council
Susan Badger-Jones, Special projects consultant
Oswaldo Bernal, OBL Media, LLC
Shane Davis, City of Portland
Rebecca Descombes, Native American Youth and Family Center
LaNicia Duke, Black Rural Networl
Charity Fain, Community Energy Project
Terrance Harris, Oregon State University
Dolores Martinez, EUVALCREE
Kheoshi Owens, Empress Rules
Cheryl L. Roberts, African American Alliance for Homeownership
Indika Sugathadasa, PDX HIVE
Huong Tran, Small business owner

2022 meeting dates	Major discussion topics
January 18	Supplier diversity update; board of directors recruiting; Working Together Grants response; contract bids for Residential and Production Efficiency programs; HB 3141 spending requirement on renewable energy programs that benefit customers with low and moderate incomes.
February 15	2022 DEI Plan goals and metrics; HB 3141 spending requirement on renewable energy programs.
March 15	Supplier diversity tracking system update; OPUC Community Advisory Council recruiting; update on 2023 budget planning.
April 19	Working Together Grants update; small business survey findings; discussion on ways to improve community partnerships; board of directors recruiting.
May 17	2022 legislative session update; community agreement for council meetings; budget workshop preview; CAC and RAC recruiting.
November 15	Review of DAC purpose and charter; member recruiting, 2023 meeting dates and work plan.

Renewable Energy Advisory Council
John Cornwell, Oregon Department of Energy
Max Greene, Renewable NW
Ryan Harvey, Pacific Power
Raphaela Hsu-Flanders, Bonneville Environmental Foundation
Tess Jordan, Portland General Electric
Anna Kim, Oregon Public Utility Commission
Brikky King, All Pacific Mortgage
Angela Crowley-Koch, Oregon Solar + Storage Industries Association
Oriana Magnera, Verde
Les Perkins, Farmers Irrigation District
Josh Peterson, Solar Monitoring Lab, University of Oregon
Amy Schlusser, Oregon Department of Energy
April Snell, Oregon Water Resources Congress
Jaimes Valdez, Portland Clean Energy Benefits Fund

2022 meeting dates	Major discussion topics
February 16	Preliminary 2021 results; HB 3141 spending requirement on renewable energy programs that benefit customers with low and moderate incomes; City of Beaverton hydropower project; 2022 legislative session update; member recruiting.
April 12	Renewable Energy Certificates policy; discussion of renewable energy industry trends and opportunities; Solar Within Reach results; 2022 legislative session update.
July 27	Discussion of equity and access, energy resilience customer needs to inform development of Energy Trust's 2023 budget.
September 14	ODOE's Oregon Renewable Energy Siting Assessment; utility-specific action plans.

APPENDIX 9: Impacts on utility capacity

This appendix provides an annual update on Energy Trust's impacts on utility capacity management. It describes ongoing and future approaches to work with utilities and other stakeholders to employ distributed energy resources to mitigate capacity constraints on a systemwide basis for utilities, alleviate local distribution system constraints and lower utility costs for the benefit of ratepayers. This appendix also discusses the contributions energy efficiency and renewable resources contribute to manage capacity and provides an overview of progress toward further development of methods to quantify and value the impact that energy efficiency and renewable resources have on managing utility transmission, supply and distribution systems.

For the 2022 Energy Trust annual report, this appendix has been reconfigured to address "capacity" instead of the historical framing to address "peak." The reason is electric utility systems may be changing such that periods of peak demand and capacity constraints will not align like they have in the past due to an influx of renewable resources that are coming onto the system during peak electric loads.

Specifically, this appendix addresses the following purposes:

- Report Energy Trust annual program impacts on capacity benefits for electric and natural gas utility systems. This includes estimated winter and summer coincident capacity benefits from 2022 energy efficiency and solar generation measures.
- Assess data and tools needed to link utility system management objectives to specific Energy Trust actions including:
    - Actionable information about opportunities to avoid specific system investments.
    - Description of methods, including areas of collaboration with utility partners, for linking the areas where investments are needed in demographic and load data for program targeting.
    - Possible enhancements or updates regarding capacity valuation and measurement used in cost-effectiveness analyses for energy efficiency.
- Identify and report on complementary pilots and initiatives that reduce capacity constraints and meet corresponding grid optimization objectives, developed in coordination with utilities. This includes work with utilities to plan where and how Energy Trust programs and measures reduce demand on critical elements of the power delivery system while optimizing co-benefits through coordinated planning.

Value of current program impacts on utility capacity benefits

Energy Trust helps customers install energy efficiency and renewable generation measures that not only save energy and offset electric and gas loads, but also provide additional benefits to the utility system and to ratepayers. Energy Trust will continue to improve its understanding of how energy efficiency savings and renewable generation provide these additional benefits to utilities in context with utility integrated resource planning and the evolving policy landscape. Energy Trust is incorporating this evolving knowledge into avoided cost benefit calculations to estimate the value of impacts of energy efficiency activities on utilities' capacity benefits.

Capacity benefit estimates from energy efficiency

For 2022, Energy Trust estimated capacity benefits from electric and gas energy-efficiency projects by calculating the percent of annual energy savings that occur during utility system's capacity constrained time periods as identified by utilities and documented and approved by the OPUC for use in the calculation of Energy Trust

avoided costs via OPUC docket UM 1893.[33] To estimate the portion of electric energy savings in those periods, Energy Trust relied on load profiles taken from the Northwest Power and Conservation Council's Seventh Power Plan.[34] For natural gas, Energy Trust calculated both peak-day demand reductions and peak-hour demand reductions by relying on peak factors from two sources. Peak day factors were based on electric analogs taken from the Northwest Power and Conservation Council's Seventh Power Plan for several end-uses, and peak day factors for space heat end-use savings were developed by NW Natural. Peak hour factors were also based on electric analogs taken from the Northwest Power and Conservation Council's Seventh Power Plan for several end-uses, and peak hour factors for space heat end-use savings were developed by NW Natural.[35] These factors are used to calculate gas peak reductions by end-use at the measure level.

Energy Trust's and NEEA's efficiency programs resulted in the following capacity benefit estimates for 2022.

Table 1: 2022 electric system efficiency capacity benefit estimates (MW) at generator

Utility	Summer MW	Winter MW	Total aMW Saved
PGE	40.67	46.15	30.37
Pacific Power	24.09	30.78	16.38
Total[36]	**64.75**	**76.93**	**46.75**

For gas measures, Energy Trust calculated peak-day and peak-hour natural gas savings, presented in the table below.

Table 2: 2022 Net natural gas system efficiency capacity benefit estimates (therms)

Utility	Peak-day therms	Peak-hour therms	Total therms Saved
NW Natural	60,635	4,464	5,394,156
Cascade Natural Gas	7,308	552	508,067
Avista	5,525	412	355,763
Total	**73,467**	**5,427**	**6,257,986**

Capacity benefit estimates from solar electric generation

Energy Trust estimated 2022 average capacity benefit contributions from residential and non-residential solar electric projects. Energy Trust estimated average generation from installed solar projects for multiple locations throughout Energy Trust service area during peak hours by using hourly generation profiles for representative project types based on variation resulting from shading, tilt, cardinal orientation and geographic location. Actual historic or real time peak contributions for each project varies based on time of day and weather. Table 3 shows the average solar generation over the peak period identified by each utility for each season. The figures below show the average daily solar generation profile shape by season and utility.

[33] The most recent information on capacity values and calculations used in UM 1893 is available online: https://apps.puc.state.or.us/orders/2021ords/21-476.pdf

[34] https://nwcouncil.app.box.com/s/ph0by9u53vygowx42rms5oytojhdmg5x

[35] NW Natural peak factors can be found in Chapter 4 of NW Natural's 2018 IRP on pages 4.7 and 4.8. Available online https://webfrontend-sc-pd.azureedge.net/-/media/nwnatural/pdfs/nwnatural_2018_irp.pdf?la=en&rev=f4f7b91117c94e498d04f5f13ce3b776&hash=73D349C4E84F57B9CE6B10C65F10B789

[36] Energy Trust's stated electric demand reduction targets for 2022 were 65.2 MW of reduced demand during periods of summer peak and 77.0 MW of reduced demand during periods of winter peak.

Table 3: 2022 electric system solar capacity benefit estimates (MW) at generator

Utility	System Count	Summer MW	Winter MW	Total aMW	Total Nameplate MWdc
PGE	2,414	5.13	1.45	6.58	25.79
Pacific Power	1,245	1.05	0.21	1.26	12.70
Total	**3,659**	**6.18**	**1.66**	**7.84**	**38.49**

Figure 1: Average hourly August solar generation profile from all 2022 solar installations in Portland General Electric service area

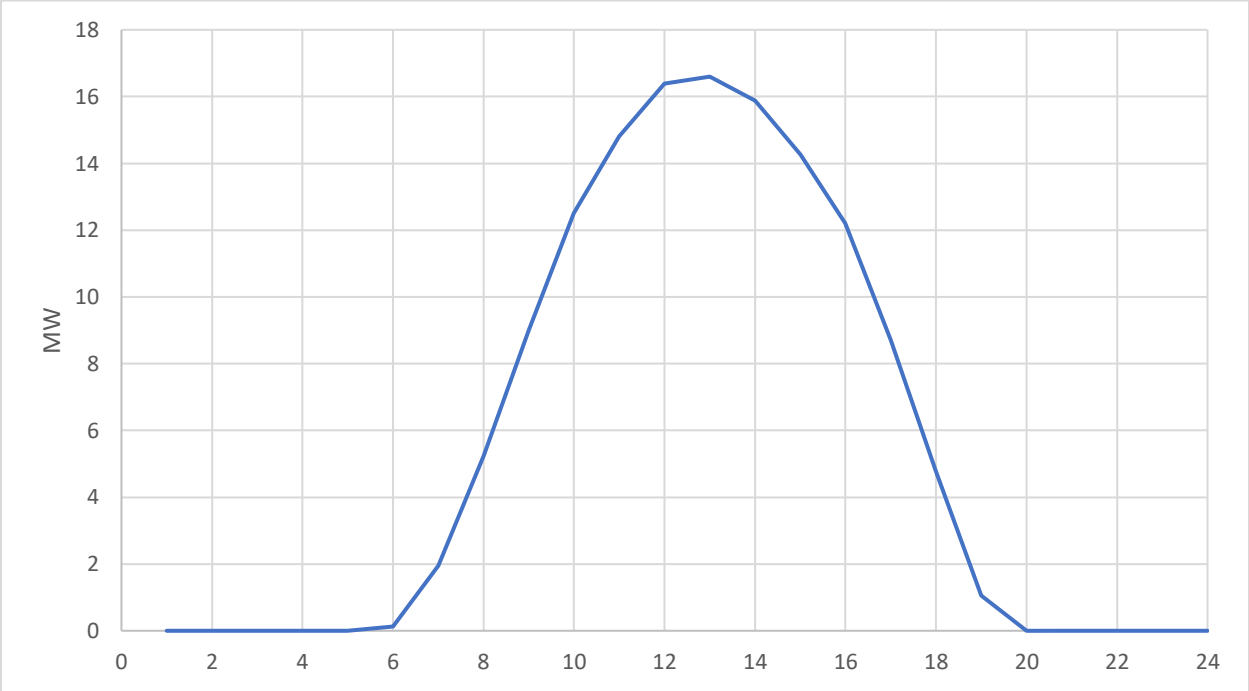


Figure 2: Average hourly January solar generation profile from all 2022 solar installations in Portland General Electric service area

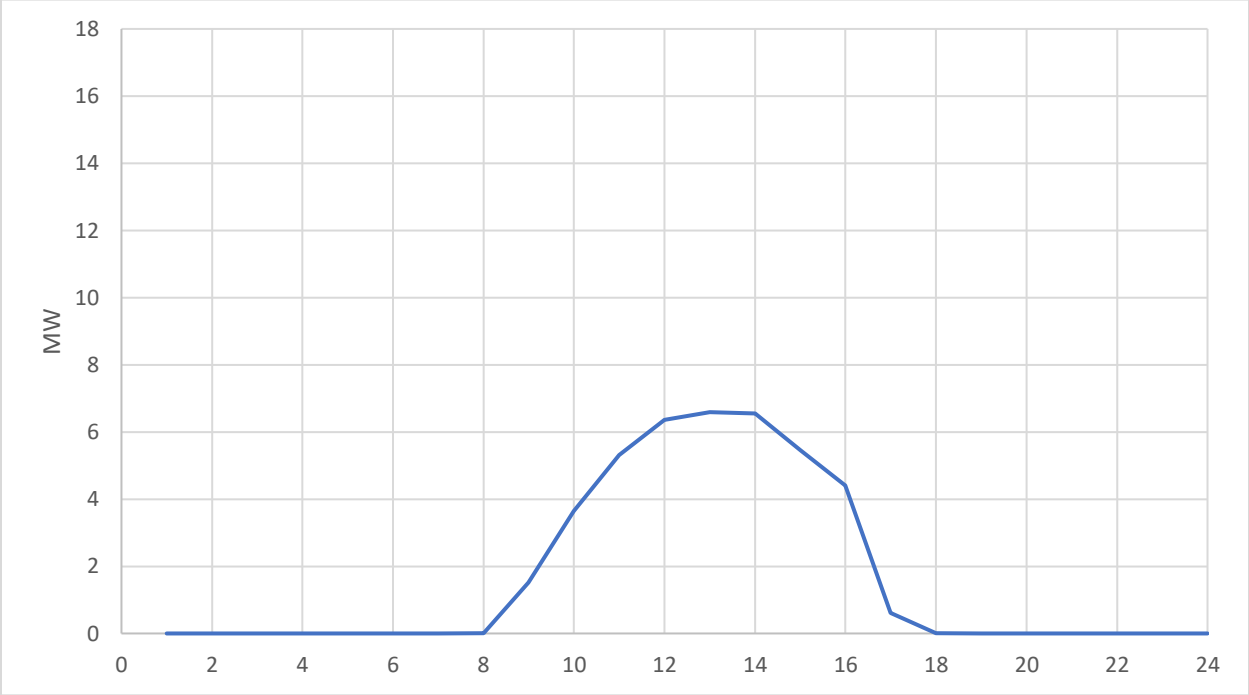


Figure 3: Average hourly August solar generation profile from all 2022 solar installations in Pacific Power service area

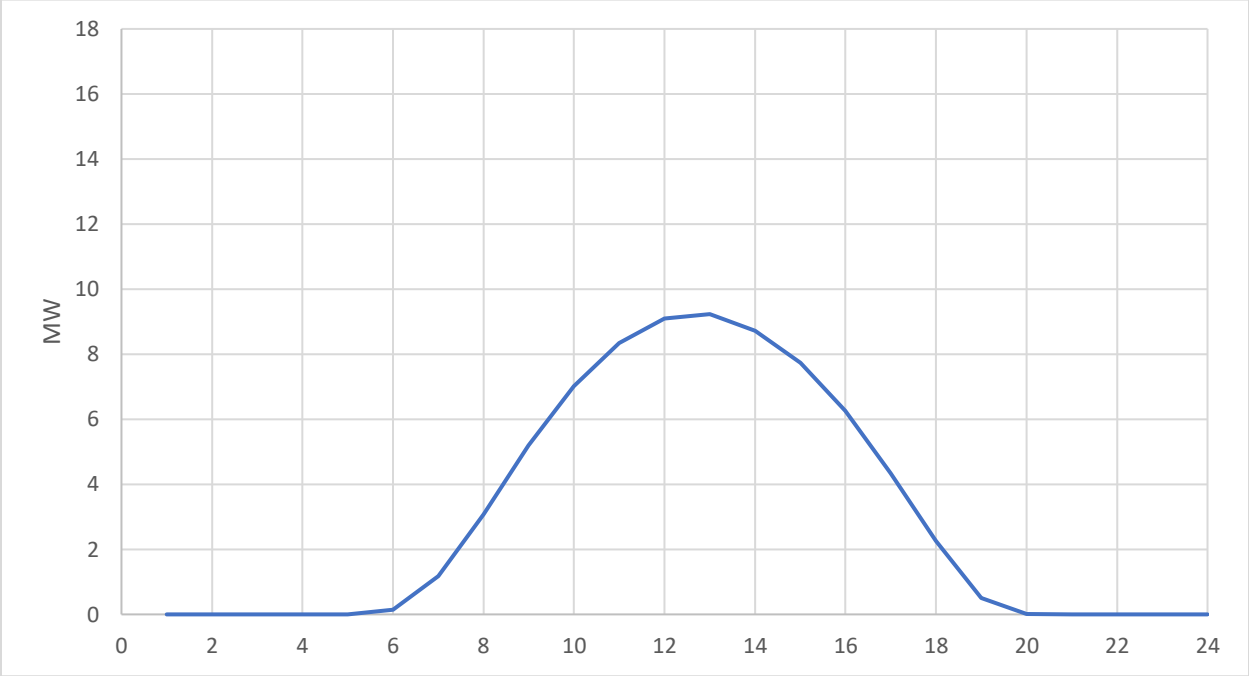
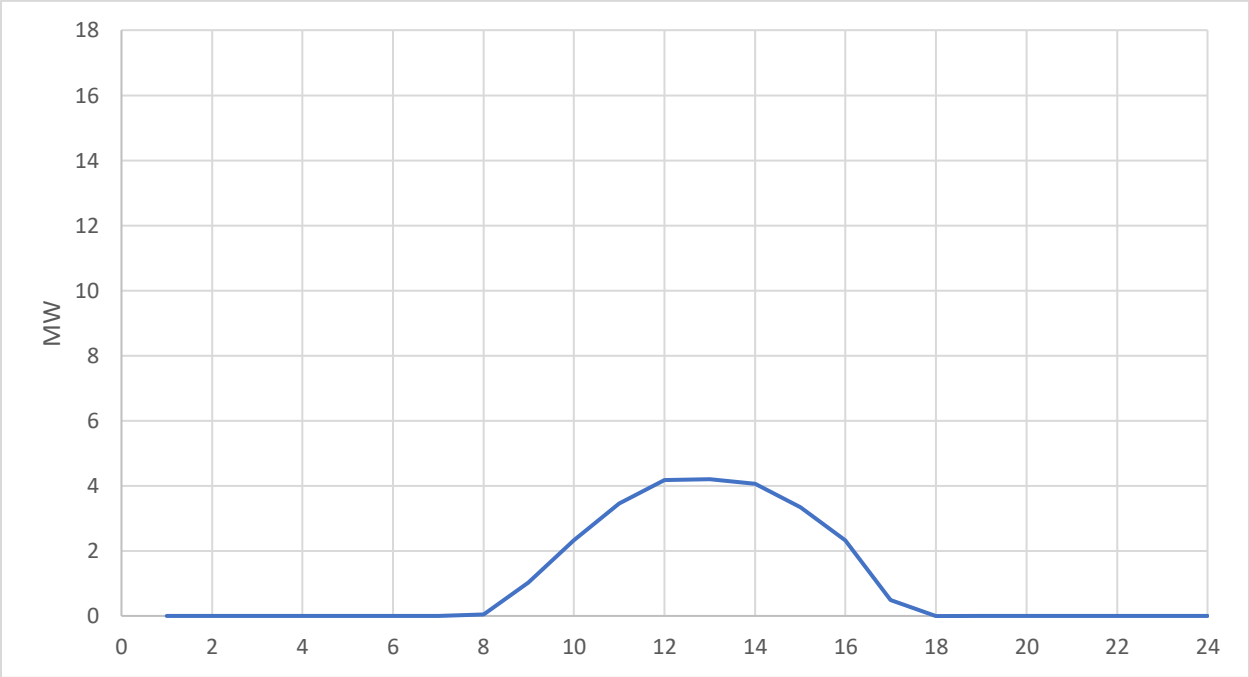


Figure 4: Average hourly January solar generation profile from all 2022 solar installations in Pacific Power service area



The above tables and figures exclude demand reduction estimates from renewable energy generation projects other than solar electric projects. Energy Trust has not incorporated these impacts into reporting because there are a relatively small number of projects with high degrees of production variability. More work is required to estimate the demand contributions of these projects and Energy Trust will consider doing so in future reporting.

Data and tools needed to link utility grid objectives to specific Energy Trust actions

PGE's 2021 demand response promotions carried into completed in 2022. These promotions were focused on enrolling PGE customers in their thermostat demand response program through point-of-sale demand response incentives, coupled with energy efficiency incentives, through PGE's online marketplace and through outreach to Energy Trust customers with gas furnaces and central air conditioning systems who purchase smart thermostats through Energy Trust's online offer.

The Northwest Energy Efficiency Alliance (NEEA) and regional stakeholders continued the End-Use Load Research project in 2022 to help gather metered data for load profile development. By the end of 2022, meter installations were nearly completed, with additional installations expected to be fully completed by the end of March 2023 (with meters remaining in place until 2024). The Northwest has not conducted large-scale studies on how different types of residential and commercial customers use electricity on a daily basis for almost 30 years. The Home Energy Metering Study and the Commercial Energy Metering Study aim to generate data to update a number of end-use profiles. The End-Use Load Research project is a key component of Energy Trust's strategy to adopt updated end use and whole home load shape estimations when they become available. This study design was informed by a collaborative planning effort conducted by NEEA's partners, including Energy Trust. The main objective of this study is to develop a robust characterization of energy consumption data for key heating and cooling measures to support planning and implementation to pursue clean energy goals and support utility information needs.

Energy Trust activities that help meet grid objectives in coordination with utilities

Energy-efficiency programs help electric and natural gas utilities address demand-related challenges. Energy Trust can provide further benefit to utility systems by increasing the saturation of energy-efficient, demand response-capable equipment (such as internet connected thermostats and heat pump water heaters with built in Wi-Fi), providing additional options for utilities when considering potential demand response programs. Utility demand response programs can use this equipment as a resource in reacting to capacity constraint events.

Through targeted load management pilot designs, Energy Trust is collaborating with utility partners to offer additional incentives for measures and services that contribute to helping utilities manage capacity constraints. Additionally, Energy Trust's well-established program marketing and outreach efforts, sales channels, contractor connections and customer relationships may prove valuable to utilities in marketing combined efficiency and demand management equipment and service packages. In 2020, the OPUC issued guidelines to investor-owned electric utilities to develop distribution system plans for their grid systems. Energy Trust has been tracking developments related to these distribution system plans via OPUC docket UM 2005. Going forward in 2023, Energy Trust expects to work collaboratively with utilities to provide data in support of these plans and to structure related pilots that emerge from these plans. Pending utility identified grid needs, Energy Trust also expects to provide additional efficiency and renewable investments for localized areas to support utility distribution system needs.

Coordination with Pacific Power

Energy Trust meets with Pacific Power on a regular basis to review and assist in developing new offers that focus on demand response benefits but also have an energy efficiency value. Early engagement in these offers helps align the programs teams to better serve the customers by minimizing customer confusion. Typical engagements begin with review of the project(s) to see where there are areas of overlap and opportunities to coordinate. Energy

Trust provides comments on all Pacific Power Advice Letters prior to submission to the OPUC. Following approval, Energy Trust and Pacific Power convene outreach and implementation teams to develop a go-to-market strategy that serves the missions of each organization. To date Energy Trust and Pacific Power have collaborated on the Smart Battery, Agricultural, Commercial SEM and Residential thermostats and water heater offers and are well poised to continue coordination as these, or any new, offers expand into the market. Energy Trust has worked to develop similar offers with PGE and therefore is able to apply the lessons learned from those projects to the work with Pacific Power.

Coordination with Portland General Electric

Smart Grid Test Bed
Energy Trust acts as a representative on PGE's advisory committee for its Smart Grid Test Bed Demand Response pilot. In this role, Energy Trust provides advice on the design of the Test Bed and feedback on the phase two pilot, which was approved in 2021. In 2022, Energy Trust reviewed the implementation plans for the first two projects in phase II of the test bed. A key activity was also working with PGE to coordinate planning for efficiency and demand control initiatives for home water heaters.

Smart Grid Advanced Load Management & Optimized Neighborhood (SALMON)
In 2021, the U.S. Department of Energy awarded a Connected Communities grant to PGE for the Smart Grid Advanced Load Management & Optimized Neighborhood (SALMON) program. SALMON will study the potential for promoting Distributed Energy Resources and energy efficiency measures to transform one North Portland neighborhood into a virtual power plant. Expected outcomes are reducing utility bills, avoiding greenhouse gas emissions, and optimizing Demand Response applications to interact with the grid to manage loads. Energy Trust helped support the grant process in 2021 and will collaborate with PGE, Community Energy Project, NEEA and the National Renewable Energy Laboratory to implement this project through 2027. The Connected Communities grant implementation period began in June 2022, and outcomes for SALMON thus far have included internal program initiation and development activities, market characterization studies, and the development of an evaluation plan. Program offers are in development through the cataloguing and analyzing of existing energy efficiency measures and solar + storage incentives to adequately forecast participation in the study area. Combining residential, small and medium business, and multi-family market segments, SALMON seeks to build a 1.4-megawatt flexible load and generate 10% average savings across all treated buildings.

Flex Feeder Contract
Additional support for the SALMON program will come from the Flex Feeder contract between Energy Trust and PGE. In support of demand response initiatives, Energy Trust will develop new energy efficiency measures, and establish their estimated load flexibility values. All approved measures will be deployed as a supplement to the SALMON program offerings in the study area.

Smart Inverter Demonstration Project
As part of the Smart Grid Test Bed Phase II proposal, PGE submitted a budget and outline for a smart inverter demonstration project that included a role for Energy Trust as a design and implementation partner. Energy Trust contracted with PGE to receive funding for the Energy Trust work associated with the project The planning phase of the demonstration project took place in 2022 and the implementation will take place in 2023and 2024. The primary goal of this demonstration is to allow PGE to explore the value of distributed solar as an operational grid resource.

Smart Battery Pilot
In 2020, PGE launched a residential Smart Battery Pilot designed to provide incentives for 525 residential battery energy storage systems located "behind the meter" in customers' homes. The individual customer-owned systems combine to create a "virtual power plant" that can be used to provide valuable grid services. The five-year pilot will allow PGE to study how to optimize the use of these batteries to benefit grid management, while ensuring customers also receive the benefits they want from owning the battery. Energy Trust has contracted with PGE to

provide implementation support for the PGE pilot and help connect customers and Solar trade ally contractors interested in participating in this program. As part of this pilot, Energy Trust is providing subject matter expertise, support for customer outreach, trade ally education, quality management, application review and upfront incentive processing. In 2022, Energy Trust provided technical support as PGE considered methods to incorporate trade ally and customer feedback to improve the pilot program through the second half.

EPS Energy Smart Home offers

In 2020, Energy Trust finalized research and prospective plans to integrate distributed energy resources into residential new construction programs to deliver benefits to the grid. This work revealed that, in the future, distributed energy resources will deliver significant value for residential customers and utilities beyond just energy efficiency and solar generation. The research suggested that program and installation costs of distributed energy resources could be reduced if distributed energy resources were considered and adopted during the construction of a home as opposed to being retrofitted into the home at a future date. Measures identified during this research as valuable included grid interactive water heaters, smart thermostats, solar + smart inverters or solar + battery storage, electric vehicle chargers and others. In 2020, Energy Trust rolled out the Energy Smart Home package providing an additional incentive for new homes that incorporated specific 'energy smart' measures. For 2022, Energy Trust simplified the Energy Smart Home package to make it more accessible for builders. In 2023, Energy Trust is studying the integration of solar + storage in new construction as it relates to energy resilience and exploring coordination with PGE on a project in the Smart Grid Test Bed where PGE is interested in providing incentives for technologies they deem demand response beneficial.

Targeted load management pilots with utilities

In 2022, Energy Trust and NW Natural completed the third and final phase of a pilot project to vet energy efficiency against supply side resources to address future location specific capacity constraints. This originated in 2019, when NW Natural filed the pilot proposal with the OPUC as an amendment to their 2018 Integrated Resource Plan (IRP). The proposal included pilot design, a research hypothesis, key research questions and the overall objectives of the pilot.

The pilot area was established in NW Natural service area in Cottage Grove and Creswell, Oregon. A pre-pilot Energy Trust program activity baseline was established for the area based on an average of peak therm and therm savings and project counts during the five years preceding the pilot period. Outlier years that demonstrated significant deviations in results compared to surrounding years were addressed by taking a three-year average of the outlier year and the years before and after the outlier year and applying that number as a replacement.

Phase 1 of the pilot completed in July 2020. Phase 1 focused on increasing awareness of Energy Trust and Energy Trust offerings in the targeted area through increased marketing and outreach. Slightly more projects (99 compared with 94) were implemented in the pilot area during the first phase than during the baseline period which preceded the pilot. However, the peak therms saved per project were lower in Phase 1 than the peak savings observed during the baseline period. It is believed that this result is related to the COVID-19 pandemic, which changed program priorities to focus on pandemic impacts on the market at large and also related pandemic impacts on customer behaviors.

Phase 2 was completed in July 2021. Energy Trust promoted increased incentives (maxed out to utility cost test cost-effectiveness caps) through targeted marketing and outreach. This resulted in peak therm and annual therm savings that were respectively 90% and 61% greater than were observed during the established baseline period.

Phase 3 was completed in July 2022. Energy Trust provided incrementally increased incentives (above what is cost-effective statewide) based on the application of local avoided cost values for subjecting pilot measures for cost-effectiveness screening using the utility cost test. Energy Trust continued to promote the pilot offerings through targeted marketing, outreach, and participation agreements with trade allies serving the local area. This

resulted in peak therm and annual therm savings that were respectively 69% and 27% greater than were observed during the established baseline period.

Energy Trust is coordinating with NW Natural to document findings and summarize the pilot prior to NW Natural's next IRP filing to inform similar efforts in the future.

APPENDIX 10: Higher-value solar applications

In 2022, in addition to standard program offerings, the Solar program focused on activities to improve equitable access to solar for customers with low to moderate incomes and to support innovative applications of solar that provide greater value to communities or the grid. This appendix provides information and context on higher-value applications of solar, market barriers and trends.

Advanced solar systems

Solar systems paired with "smart" inverters or "smart" battery storage can provide greater benefits to customers and the grid compared with conventional solar. Energy Trust defines advanced solar systems as those that integrate photovoltaics with advanced inverters, advanced battery energy storage systems and/or complementary flexible loads.

Advanced "smart" inverter adoption

The Solar program collects inverter manufacturer and model data for each system installed and has identified "smart" models capable of advanced functions that can be remotely enabled and programmed via an internet connection to utilize those capabilities. Table 1 summarizes adoption of these inverter models compared with full program volume. Other models may also have latent advanced functions, so this is likely a conservative estimate.

In 2022, Energy Trust began working with PGE on the planning phase of a Smart Inverter Demonstration project as part of the Smart Grid Test Bed Pilot to help the utility gather lessons on the benefits smart inverters can provide the grid. In 2023, PGE and Energy Trust will begin implementation of the demonstration project to understand the costs, capabilities and requirements of integrating smart inverters into PGE's Distributed Energy Resource Management System.

Table 1: Energy Trust solar installations with advanced "smart" inverters[37]

Year installed	Installation with advanced inverters	Total solar installations	% of total
2008	0	253	0%
2009	14	475	3%
2010	81	1,198	7%
2011	180	1,329	14%
2012	348	1,242	28%
2013	173	881	20%
2014	247	1,291	19%
2015	448	1,801	25%
2016	508	1,750	29%
2017	758	1,795	42%
2018	1,129	1,787	63%
2019	1,059	1,357	78%
2020	1,345	1,812	74%

[37] Table 1 counts only installations that have advanced inverters that are capable of being remotely updated and programmed to provide grid services. Other installations may have inverters that can be updated manually.

2021	2,120	2,905	73%
2022	2,680	3,660	73%
Total	**11,090**	**23,536**	**47%**

Solar with advanced battery storage adoption

The Solar program has seen growing customer interest for pairing battery storage with a solar system.[38] Table 2 summarizes solar + storage installations in the program through 2022. The number of completed projects increased dramatically in 2022 due in part to supply chain constraints being alleviated. Since 2016, the majority of solar + storage applications have specified equipment that could be categorized as advanced battery energy storage systems capable of providing additional benefits to the customer and the utility grid beyond backup power during an outage.

Starting in 2020, solar + storage adoption was bolstered by two additional incentives that were made available: the Oregon Department of Energy's Solar + Storage Rebate and a PGE Smart Battery Pilot. Energy Trust plays an implementation partner role in the PGE Smart Battery Pilot, which launched in 2020 and is planned to continue through summer 2025. In 2023, Pacific Power announced it will begin development of a battery storage program in Oregon.

Table 2: Energy Trust solar + storage installations

Year installed	Installation with battery storage	Total solar installations	% of total
2008	4	253	1.6%
2009	2	475	0.4%
2010	6	1,198	0.5%
2011	4	1,329	0.3%
2012	8	1,242	0.6%
2013	2	881	0.2%
2014	6	1,291	0.5%
2015	2	1,801	0.1%
2016	10	1,750	0.6%
2017	42	1,795	2.3%
2018	66	1,787	3.7%
2019	34	1,357	2.5%
2020	72	1,812	4.0%
2021	73	2,905	2.5%
2022	237	3,660	6.5%
Total	**568**	**23,536**	**2.4%**

Equity focused solar initiatives

Despite a strong market and high customer demand, solar remains out of reach for many households. Historic participation in Energy Trust's solar offers has not accurately represented Oregon's demographics, and the

[38] Energy Trust does not have a storage incentive offering. Customers who choose to install an integrated solar + storage system are eligible for a standard solar incentive, ODOE Solar + Storage Rebate, and the federal Investment Tax Credit. Additionally, PGE customers with qualifying equipment may qualify for on-bill rewards or an instant rebate through PGE's Smart Battery Pilot.

program has shifted increasing focus and resources to support the communities previously underserved. The objective is to foster a more equitable solar market by designing incentive offers, program strategies and solutions to support people of color, people with low and moderate incomes and people in rural communities to expand the benefits of solar to all utility customers.

From 2017 through early 2019, Energy Trust convened a low- and moderate-income solar work group that included public entities, community-based organizations and industry representatives. The group developed strategies to address market barriers and work toward a more equitable distribution of solar projects. Many of the organizations involved in the solar work group are still engaged with Energy Trust through the Diversity Advisory Council or other more direct program engagement. The Solar program continues to implement feedback from the work group to develop new offers to support projects that benefit low- and moderate-income customers.

HB 3141, passed in the 2021 Oregon legislative session, established a new metric requiring a minimum 25% of utility revenue for the renewable energy sector to be invested in projects and services supporting customers with low and moderate incomes.

Examples of this work:

- Since late 2019, the program has offered Solar Within Reach for income-qualified residential customers. This offer provides a higher incentive amount for homeowners with moderate incomes who may have less ability to use tax incentives or have higher financing needs. In 2022, the program received 543 Solar Within Reach applications and 523 projects were completed, with $3.5 million of Solar Within Reach incentives paid. This contributed to Energy Trust spending 29% of 2022 renewable energy revenues serving customers with low or moderate incomes, satisfying the new metric established in HB 3141.

- In 2020, the Solar program began offering development assistance incentives for small or public and nonprofit projects applying to the Oregon Community Solar Program. To qualify for development assistance, applicants must show how the project will bring additional benefits to low-income or other underserved customers. The program received 15 enrollments for development funds through 2022 and paid $74,534 incentives so far in support of qualifying community solar project development.

- In 2021, the program began offering technical assistance with Bonneville Environmental Foundation for project managers interested in pursuing projects that bring additional benefits to low-income or other underserved customers. Since launch, Energy Trust has paid $2,475 for technical assistance to potential project managers that need additional coaching and assistance in navigating the Community Solar Program. Coaching assistance is intended to provide additional support to potential community-based project managers beyond just providing additional funding.

- Starting in 2020, the Solar program made increased incentives available for non-residential projects for tribal, affordable multifamily properties and eligible nonprofit customers with a stated mission and track record of serving underserved communities. These incentives offset a greater portion of the upfront cost of a project and support Energy Trust's goals to expand the benefits of solar to more underserved Oregonians, and those serving them. In 2022, the program received 51 applications and 21 projects were completed, with $1 million in incentives paid.

- In 2022, for the first time, the Solar program dedicated incentive funds to enable a large-scale (>360 kW-AC) community solar project to reserve additional capacity for subscribers that meet low-income qualifications. The program selected one project for a custom incentive through a competitive process. When installed, this project is expected to result in 608 kW-AC of additional capacity dedicated for subscribers with low incomes.

- In 2022, the Solar program paid $153,000 incentives for the installation of two small (<360 kW-AC) community solar systems, providing an additional 40 kW-AC of capacity reserved for subscribers with low

incomes. These projects were selected for funding as part of a 2021 solicitation for small-scale community solar projects.

- In 2021, Energy Trust in collaboration with a team of community-based organizations was awarded a grant from the National Renewable Energy Laboratory to increase solar awareness in communities of color. The Solar program is working with the African American Alliance for Homeownership, Verde, Adelante Mujeres, Community Energy Project, Unite Oregon, Asian Pacific American Network of Oregon and Solar Oregon to develop and test a training program for community representatives to inform members of Black, Latino, immigrant and refugee communities in the Portland area about residential solar systems and how to obtain them. Energy Trust is playing a facilitator role while the work and decision-making will be driven by the community-based organizations.

APPENDIX 11: Quarter four results

This appendix includes only activity funded by Oregon electric utility customers of Portland General Electric and Pacific Power under state law and by Oregon natural gas customers of NW Natural, Cascade Natural Gas and Avista through regulatory agreements between the OPUC and each natural gas utility.

I Revenues and expenditures tables[39]

A. Revenues under OPUC grant agreement[40]

Source		Q4 actual revenues		Q4 budgeted revenues	Budget variance
PGE Efficiency	$	19,346,972	$	20,597,140	-6%
PGE Renewables	$	2,458,932	$	2,035,170	21%
Pacific Power Efficiency	$	13,498,453	$	13,254,555	2%
Pacific Power Renewables	$	1,537,546	$	1,660,900	-7%
NW Natural	$	4,582,232	$	5,373,753	-15%
NW Natural Industrial DSM	$	2,531,586	$	2,010,529	26%
Cascade Natural Gas	$	1,116,460	$	1,311,606	-15%
Avista	$	1,235,823	$	1,235,823	0%
Total	**$**	**46,308,005**	**$**	**47,479,475**	**-2%**

B. Expenditures under OPUC grant agreement

Source		Q4 actual expenditures		Q4 budgeted expenditures	Budget variance
Portland General Electric	$	30,981,746	$	37,759,097	-18%
Pacific Power	$	21,186,293	$	24,068,217	-12%
NW Natural	$	7,752,338	$	9,179,949	-16%
NW Natural Industrial DSM	$	2,373,177	$	2,677,195	-11%
Cascade Natural Gas	$	1,580,239	$	1,787,080	-12%
Avista	$	1,019,659	$	1,604,126	-36%
Total	**$**	**64,893,452**	**$**	**77,075,665**	**-16%**

[39] Columns may not total due to rounding.
[40] Revenues include ratepayer revenue collected for energy-efficiency programs and ratepayer-funded public purpose charge revenues collected for renewable energy activities.

C. Expenditures under OPUC grant agreement by sector and program[41]

		Q4 actual expenditures	Q4 budgeted expenditures	Budget variance
Commercial	Existing Buildings	$ 18,300,545	$ 24,400,571	-25%
	New Buildings	$ 5,057,573	$ 6,298,324	-20%
	NEEA Commercial	$ 639,578	$ 944,280	-32%
	Commercial total	**$ 23,997,696**	**$ 31,643,175**	**-24%**
Industrial	Production Efficiency	$ 14,541,220	$ 18,030,388	-19%
	NEEA Industrial	$ 16,398	$ 8,753	87%
	Industrial total	**$ 14,557,617**	**$ 18,039,141**	**-19%**
Residential	Residential	$ 16,914,830	$ 17,713,491	-5%
	NEEA Residential	$ 746,330	$ 1,188,256	-37%
	Residential total	**$ 17,661,160**	**$ 18,901,747**	**-7%**
	Energy efficiency total	**$ 56,216,474**	**$ 68,584,063**	**-18%**
Renewables	Solar	$ 3,437,758	$ 4,788,443	-28%
	Other Renewables	$ 2,484,425	$ 934,116	166%
	Renewable generation total	**$ 5,922,183**	**$ 5,722,559**	**3%**
	Administration	**$ 2,754,795**	**$ 2,769,042**	**-1%**
	Total	**$ 64,893,452**	**$ 77,075,665**	**-16%**

D. Incentives paid

Qtr	PGE efficiency	Pacific Power efficiency	NW Natural efficiency	Cascade Natural Gas efficiency	Avista efficiency	PGE generation	Pacific Power generation	Total
Q1	$ 5,240,468	$ 2,384,863	$ 2,376,681	$ 194,359	$ 111,549	$1,603,475	$ 522,337	$ 12,433,732
Q2	$ 5,769,540	$ 4,142,581	$ 2,265,033	$ 238,774	$ 221,012	$2,592,224	$ 916,675	$ 16,145,837
Q3	$ 7,922,522	$ 4,939,583	$ 3,825,259	$ 357,805	$ 270,012	$1,809,575	$ 839,634	$ 19,964,391
Q4	$18,072,280	$12,677,992	$ 6,610,934	$ 888,060	$ 590,458	$3,150,660	$1,419,541	$ 43,409,925
Total	**$37,004,810**	**$24,145,019**	**$15,077,907**	**$1,678,997**	**$1,193,031**	**$9,155,934**	**$3,698,187**	**$ 91,953,885**

E. Low- and moderate-income renewable energy expenditures[42]

	YTD renewable revenues	YTD LMI expenditures	Percent of revenues benefiting LMI customers
Portland General Electric	$ 10,773,985	$ 3,908,501	36%
Pacific Power	$ 6,870,486	$ 1,179,109	17%
Total	**$ 17,644,470**	**$ 5,087,610**	29%

[41] Administration is different than administrative and program support costs as defined by the OPUC's performance measure, which also includes program costs in the following areas: program management, program delivery, program incentives, program payroll and related expenses, outsourced services, planning and evaluation services, customer service management and Trade Ally Network management.
[42] This table reports on a 25% minimum renewable energy spending requirement for Energy Trust under HB 3141. Revenues include all renewable energy revenues, and expenditures are only those that benefit customers with low and moderate incomes.

II Savings and generation tables[43,44,45,46]

A. Savings and generation by fuel

	Q4 savings/generation	Total annual savings/generation	Annual goal	Percent achieved YTD
Electric savings	30.5 aMW	46.8 aMW	50.6 aMW	92%
Natural gas savings	3,025,590 therms	5,942,844 therms	7,265,422 therms	82%
Electric generation	1.94 aMW	5.93 aMW	4.10 aMW	145%

B. Progress toward annual efficiency goals by utility

	Q4 savings	Total annual savings	Annual goal	Percent achieved YTD	Annual IRP target	Percent achieved YTD
Portland General Electric	20.7 aMW	30.4 aMW	29.0 aMW	105%	24.8 aMW	122%
Pacific Power	9.8 aMW	16.4 aMW	21.5 aMW	76%	18.7 aMW	87%
NW Natural	2,591,180 therms	5,079,014 therms	5,853,279 therms	87%	6,062,451 therms	84%
Cascade Natural Gas	284,320 therms	508,067 therms	752,829 therms	67%	485,188 therms	105%
Avista	150,090 therms	355,763 therms	659,313 therms	54%	447,273 therms	80%

C. Electric savings by sector and program

		Q4 savings aMW	Total annual savings aMW	Annual goal aMW	Percent achieved YTD
Commercial	Existing Buildings	5.2	10.2	15.3	67%
	New Buildings	3.1	4.6	4.8	97%
	NEEA Commercial	0.8	1.4	1.4	102%
	Commercial total	**9.1**	**16.3**	**21.5**	**76%**
Industrial	Production Efficiency	15.6	19.6	17.0	116%
	NEEA Industrial	0.4	0.7	0.8	91%
	Industrial total	**16.0**	**20.4**	**17.8**	**114%**
Residential	Residential	3.0	6.5	7.5	86%
	NEEA Residential	2.3	3.7	3.8	96%
	Residential total	**5.3**	**10.1**	**11.3**	**90%**
	Total electric savings	**30.5**	**46.8**	**50.6**	**92%**

[43] Columns may not total due to rounding.
[44] Electric savings include transmission and distribution savings.
[45] The gas savings do not include results for NW Natural in Washington.
[46] Energy Trust reports 100% of generation and capacity for renewable energy installations supported by Energy Trust's cash incentives. While some of these projects have additional sources of funding, Energy Trust enabled project completion

D. Natural gas savings by sector and program

		Q4 savings therms	Total annual savings therms	Annual goal therms	Percent achieved YTD
Commercial	Existing Buildings	991,026	1,733,530	2,469,687	70%
	New Buildings	164,885	346,119	437,460	79%
	NEEA Commercial	100,723	167,871	167,873	100%
	Commercial total	**1,256,634**	**2,247,520**	**3,075,020**	**73%**
Industrial	Production Efficiency	813,999	1,286,777	1,528,067	84%
	NEEA Industrial	-	-	-	-
	Industrial total	**813,999**	**1,286,777**	**1,528,067**	**84%**
Residential	Residential	954,958	2,408,548	2,662,335	90%
	NEEA Residential	-	-	-	-
	Residential total	**954,958**	**2,408,548**	**2,662,335**	**90%**
	Total natural gas savings	**3,025,590**	**5,942,844**	**7,265,422**	**82%**

E. Renewable energy generation by utility

	Q4 generation aMW	Total annual generation aMW	Annual goal aMW	Percent achieved YTD
Portland General Electric	1.22	3.71	2.29	162%
Pacific Power	0.72	2.22	1.80	123%
Total	**1.94**	**5.93**	**4.10**	**145%**

F. Renewable energy generation by program

	Q4 generation aMW	Total annual generation aMW	Annual goal aMW	Percent achieved YTD
Solar	1.83	5.83	3.98	146%
Other Renewables	0.11	0.11	0.11	92%
Total generation	**1.94**	**5.93**	**4.10**	**145%**

G. Utility-invested efficiency expenditures[47]

Utility	Q4 expenditures	Total annual expenditures
Portland General Electric	$ 199,692	$ 786,226
Pacific Power	$ 183,804	$ 905,132
Total	**$ 383,496**	**$ 1,691,358**

[47] This reflects utility investments of a portion of efficiency tariff funds. Funds are collected by the utility and are in addition to funds received by Energy Trust. Reports detailing activities funded by these expenditures are submitted annually by the utilities to the OPUC.