2016 Annual Report to the Oregon Public Utility Commission & Energy Trust Board of Directors

ENERGY TRUST OF OREGON
APRIL 14, 2017

UPDATED DECEMBER 15, 2017

TABLE OF CONTENTS

A glossary of program descriptions and key terms is available online at www.energytrust.org/reports.

From the executive director

I am pleased to submit my first report highlighting Energy Trust of Oregon's outstanding 2016 accomplishments and benefits to utility customers. In our highest ever year for electric and gas savings, Energy Trust exceeded all annual electric and gas efficiency goals while maintaining very low costs. We installed more standard solar capacity and generation in 2016 than ever before, with support for a record 1,200 customer-owned residential solar systems.

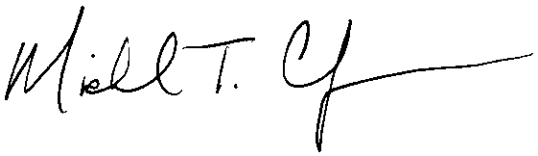
With incentives, education and a network of 2,450 contractors and allied professionals, Energy Trust helped residential, commercial and industrial customers benefit from energy-efficient and renewable energy investments at 80,000 homes and businesses.

As Oregon's economy recovered, population grew and construction increased, we engaged builders to complete more than 400 commercial new construction and major renovation projects, up 28 percent from 2015. Our work with residential builders resulted in 3,300 high-efficiency new homes in 2016 with EPS™ indicating low energy costs and carbon footprint.

Recognizing that communities around the state experience economic recovery at different rates, we enhanced outreach efforts to reach and serve Oregon's smaller cities and rural communities, moderate-income customers and Oregon's increasingly diverse population. We provided resources and energy-saving devices to help Bend and Corvallis nonprofits bolster local participation, kicked off outreach efforts to expand the benefits of solar generation to low- and moderate-income customers, and gained insights through focus groups on energy decision-making in small businesses and homes with representatives from Asian, African American and Latino communities.

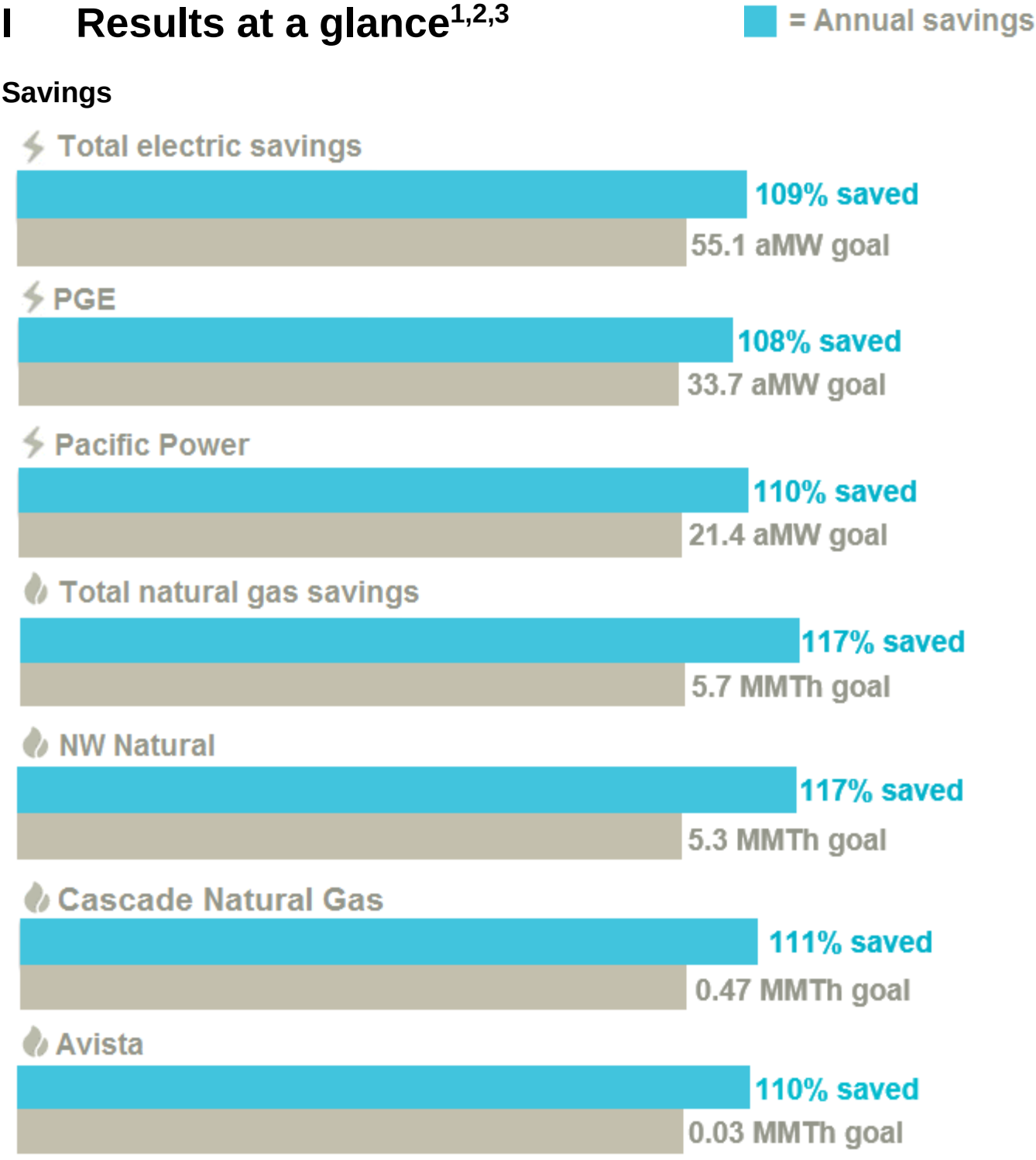
We also helped customers generate clean energy from Oregon's abundant renewable resources. In 2016, we provided incentives and quality control for the 10,000th customer solar system installed to date, and helped 14 irrigation districts identify opportunities to modernize their irrigation systems, generate hydropower, save water, use less energy and boost investment in rural communities. These districts are part of a record pipeline of 48 hydropower, biopower and geothermal projects that are receiving project development assistance to help overcome development barriers.

Thank you to all who welcomed me aboard and contributed to Energy Trust's success in 2016, including the excellent board and staff of Energy Trust. I'm especially grateful to my predecessor Margie Harris, the commissioners and staff of the Oregon Public Utility Commission, and our colleagues at Portland General Electric, Pacific Power, NW Natural, Cascade Natural Gas, Avista, Northwest Energy Efficiency Alliance and Oregon Department of Energy. We look forward to another year helping utility customers benefit from low-cost energy and renewable power.



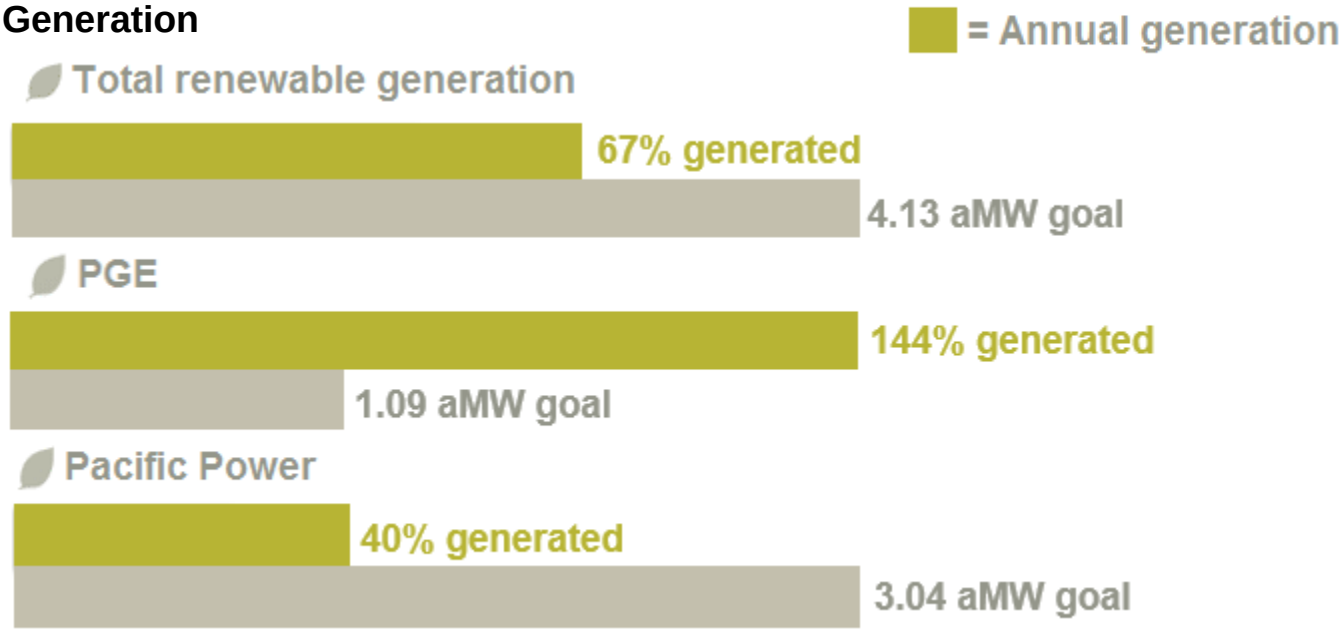
Michael Colgrove
Executive Director

I Results at a glance[1,2,3]

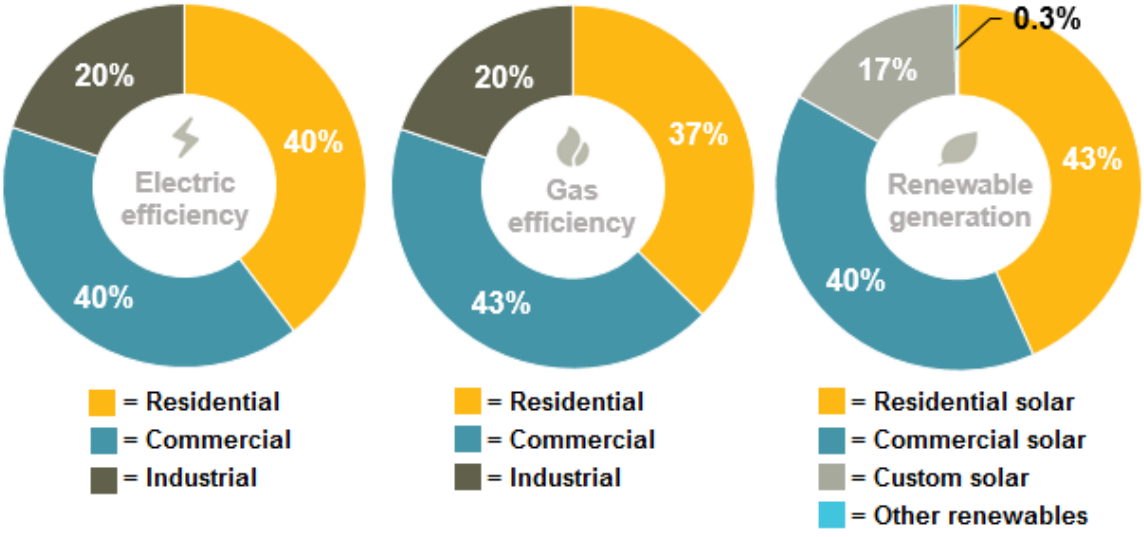


[1] This document reports net savings except in Appendix 4. Net savings are adjusted gross savings based on results of current and past evaluations.
[2] Note that aMW indicates average megawatts, MMTh indicates million annual therms and M is million.
[3] All tables include Avista savings and expenditures; however, Avista is not reflected in the board-approved goals. Goals were approved by the board in December 2015 whereas the addition of Avista for a transition period in 2016 did not occur until February 2016 at the direction of the OPUC.

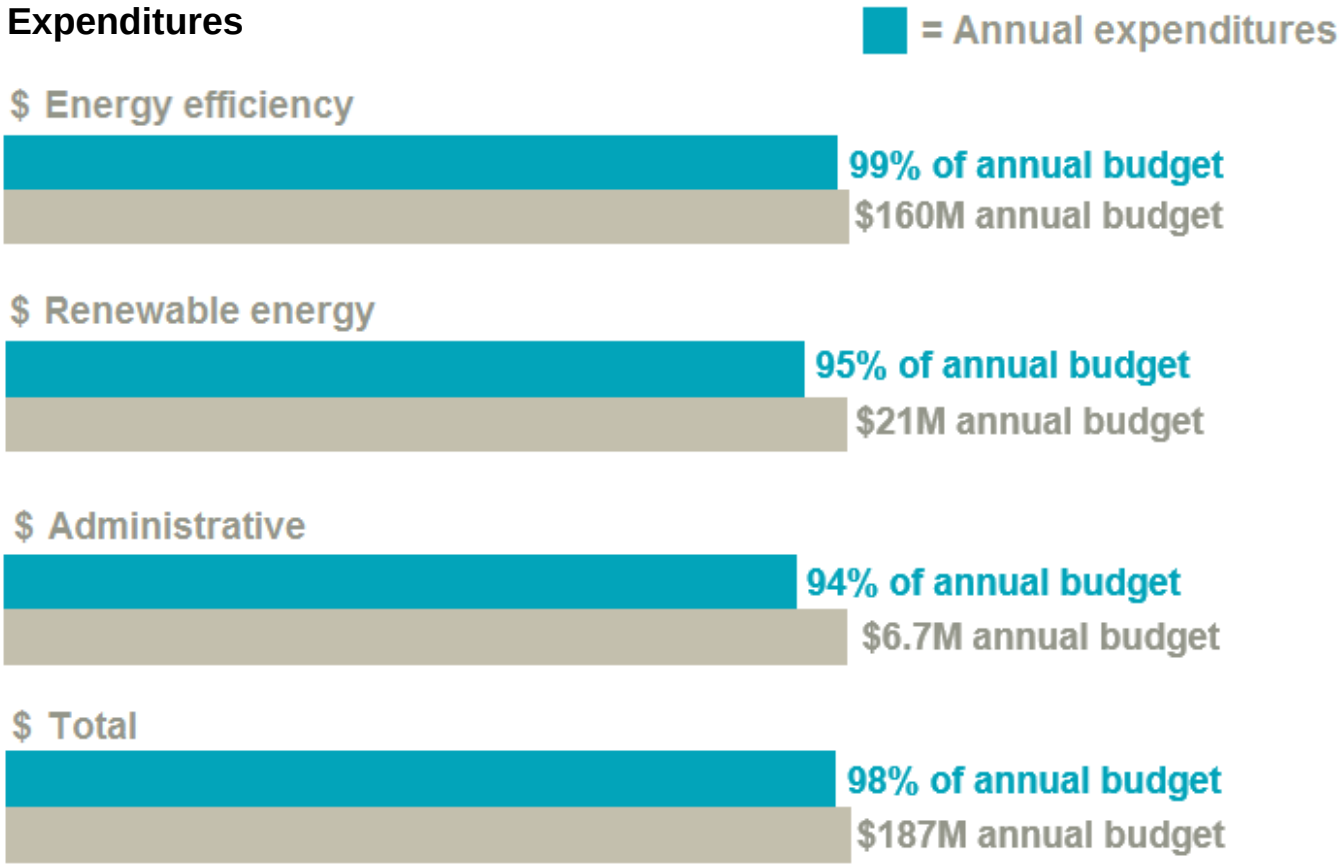
Generation



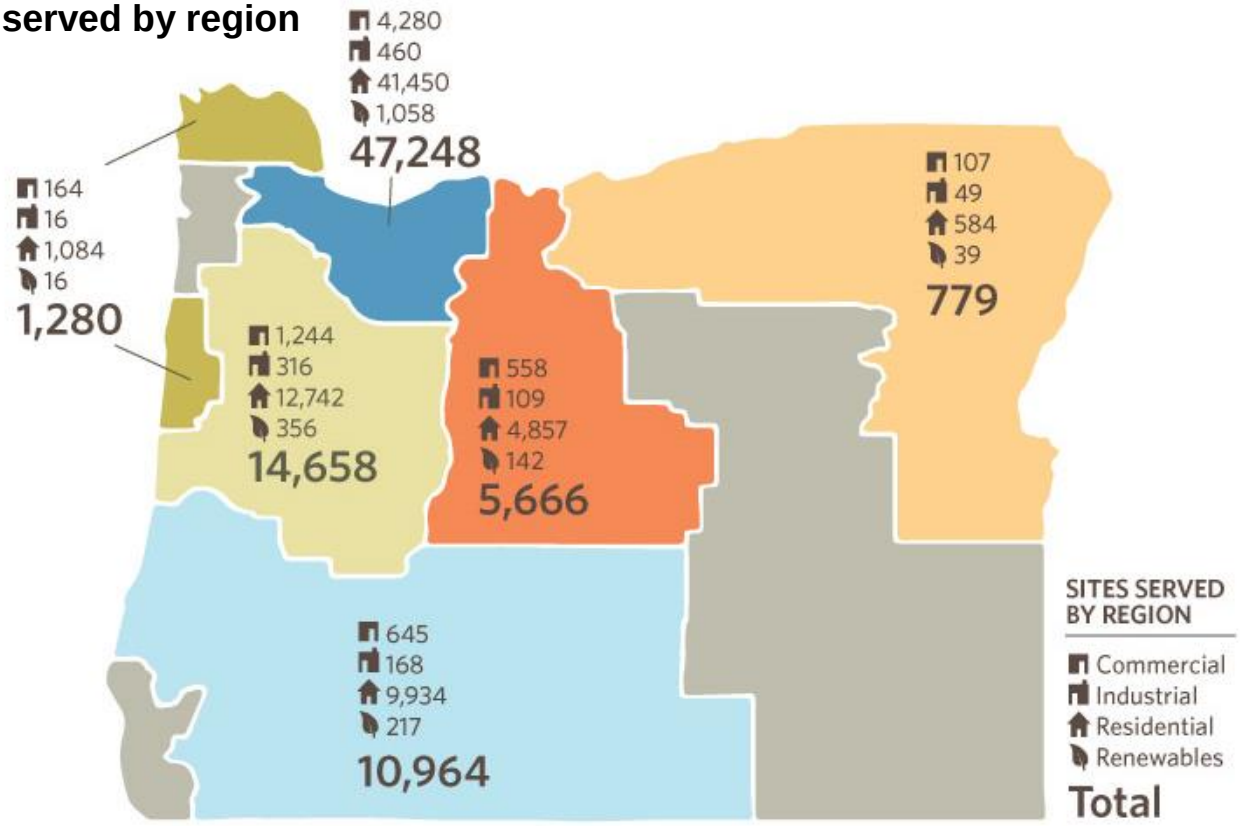
Percent of 2016 savings and generation by sector



Expenditures



Sites served by region



II Executive summary

A. Annual results[4],[5]

- **Energy Trust exceeded annual electric and gas efficiency goals, while sustaining low costs.**
  - Electric efficiency improvements completed in 2016 **saved 60 average megawatts** of electricity, about 9 percent more than the 2016 goal of 55.1 aMW, at a levelized cost[6] of 2.6 cents per kilowatt hour.
  - Gas efficiency improvements completed during 2016 **saved 6.7 million annual therms of natural gas**[7], about 17 percent more than the 2016 goal of 5.7 million annual therms, at a levelized cost of 27.9 cents per therm.
  - Energy Trust exceeded goals in all utility territories.
  - A diverse portfolio of programs and savings strategies is a strength that helps the organization adjust to variable market conditions and achieve goals. Achievements in 2016 were largely led by LEDs, new construction and commercial upgrades.
  - Savings and generation achieved in 2016 represent about **300,000 tons of carbon dioxide** kept out of the atmosphere, the equivalent of removing 52,000 cars from Oregon roads.
- **The renewable energy sector exceeded goals for standard solar but fell short of the overall goal due to the delay of two custom projects to 2017**. It is not unusual for delays to occur with large, complex projects.
  - The sector exceeded its annual targets for both utility territories for standard solar and its annual OPUC performance measure by securing 2.3 aMW of standard solar installations.
  - Total renewable energy systems installed in 2016 will **generate 2.78 aMW** of electricity.
- **Energy Trust met every OPUC performance measure,** including:
  - Maintained low administrative and program support costs at 6.2 percent of revenue, below the OPUC performance measure of 8 percent.
  - Kept staffing costs at 6.6 percent, below the 7.75 percent, three-year rolling average threshold.
  - Received consistently high customer satisfaction ratings **of 93 percent overall and 96 percent** for interaction with program representatives.

60
AVERAGE MEGAWATTS SAVED

6.7
MILLION ANNUAL THERMS SAVED

300,000
TONS OF CARBON DIOXIDE AVOIDED

2.78
AMW GENERATED

93%
CUSTOMERS SATISFIED OVERALL

[4] This document reports net savings, which are adjusted gross savings based on results of current and past evaluations. Progress toward gross annual goals are in Appendix 4.
[5] This report includes the best available energy savings data as of the date of submission. Energy savings reported here for periods prior to January 1, 2016, 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. The full True Up 2016 Report is available online at www.energytrust.org/reports.
[6] 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).
[7] Gas savings do not include NW Natural results in Washington. These results are available online at www.energytrust.org/reports.

B. Market and program trends

- **Energy Trust incentives and information helped advance the residential lighting market**, as customers selected and **installed 4.2 million LEDs in homes** in 2016—up from 2.7 million in 2015. LEDs eclipsed CFLs on retail shelves, representing 80 percent of all bulbs purchased. Sales were supported by Energy Trust's incentives and education, effective promotions with manufacturers and retailers, expanded relationships with retailers and manufacturers, and broadened certification criteria for ENERGY STAR® bulbs to include lower-cost LEDs.
- **Energy Trust helped businesses install more than 460,000 LEDs in 2016, representing about 90 percent of all efficient lighting supported by Energy Trust in businesses.** To help customers maximize lighting savings, Energy Trust changed incentives so that lighting projects including controls receive higher incentives. LED applications ranged from horticultural lighting at cannabis production facilities to grocery case lighting to city street lights.
- **In 2016, 38 percent of all newly built homes in Energy Trust's territory were rated with EPS,** an energy performance rating indicating low energy costs and carbon footprint. By engaging builders in Oregon's fast-paced construction market, especially in the Portland Metro and Bend areas, Energy Trust **rated the 10,000th EPS home since 2009**. Featuring insulation and efficient HVAC, appliances and lighting, the average EPS home is built 20 percent above code and saves homebuyers $500 a year in energy costs compared to similar sized homes.
- **Energy Trust engaged Oregon's thriving new construction market to complete a record 426 New Buildings projects, up 28 percent from 2015.** With Oregon's growing population and historically low multifamily vacancy rates, energy-efficient new construction and major renovations at multifamily buildings have been steadily increasing in the last five years. Participation from new warehouse and distribution centers also grew as Portland is viewed as a prime West Coast distribution hub.
- **For standard solar, more capacity and generation was installed in 2016 than in any other year, with support for a record 1,200 customer-owned residential solar systems**. Energy Trust connected more than 1,500 customers with solar trade allies through an online bid request form, a 37 percent increase over 2015, meeting customer demand for online self-service tools and reducing customer acquisition costs for trade allies.
- **Energy Trust tapped into public interest in water savings, rural economic development and other benefits** to help customers at 14 irrigation districts identify energy efficiency and renewable energy projects through Energy Trust's irrigation modernization initiative with Farmers Conservation Alliance. Energy Trust's collaborative irrigation modernization strategy leverages the wide range of benefits irrigation modernization projects can provide, including energy generation, energy and water savings, and investment in rural communities. These 14 districts are part of a **record**

4.2 MILLION LEDS INSTALLED IN HOMES

460,000 LEDS INSTALLED IN BUSINESSES

COMPLETED 10,000TH EPS HOME SINCE 2009

COMPLETED 426 NEW BUILDINGS PROJECTS

SUPPORTED 1,200 CUSTOMER-OWNED RESIDENTIAL SOLAR SYSTEMS

pipeline of 48 hydropower, biopower, geothermal and wind projects receiving project development assistance to help potential new renewable energy projects overcome development barriers. For more information about Energy Trust's project development assistance activities, see Appendix 3.

48

OTHER RENEWABLE PROJECTS RECEIVING PROJECT DEVELOPMENT ASSISTANCE

- **Energy Trust engaged more first-time participants through outreach and collaboration**. The organization provided resources and energy-saving devices to help Bend Environmental Center and Corvallis Environmental Center bolster local participation. More moderate-income residents benefited from efficient home efforts through Savings Within Reach enhanced incentives, and renters gained a new gas furnace incentive. Outreach to Klamath Basin farmers was reinforced through coordination with Sustainable Northwest, and Energy Trust worked with Clean Energy States Alliance and the U.S. Department of Energy's SunShot program on outreach efforts to expand the benefits of solar generation to low- and moderate-income customers.
- **Energy Trust removed and recycled 10,700 old, inefficient refrigerators and freezers from homes in 2016**, bringing the total recycled to 125,000 since 2008. Given Energy Trust's success and increased federal standards for refrigerators, Energy Trust incentives are no longer needed to influence consumers to remove energy-wasting appliances from their homes.

RECYCLED 10,700 OLD, INEFFICIENT REFRIGERATORS

C. Notable achievements

- **Energy Trust began delivering services to Avista's Oregon customers on a limited basis**, following the OPUC's decision to transfer administration and delivery of gas efficiency services to Energy Trust. Avista serves approximately 90,000 Oregon customers in Roseburg, Medford, Klamath Falls, La Grande and surrounding areas. Energy Trust's full range of gas services will be available in Avista's Oregon territory in 2017.
- **The board of directors and staff completed transition to a new executive director** following the planned retirement of Margie Harris, the founding executive director who led the organization for 15 years. The appointment of Michael Colgrove from the New York State Research and Development Authority followed a rigorous five-month national search for candidates informed by stakeholders, including the OPUC, utilities and Energy Trust advisory councils.
- **Energy Trust was recognized with four awards**, including as one of the best Oregon nonprofits to work for by Oregon Business magazine. The American Council for an Energy-Efficient Economy named Energy Trust's founding executive director, Margie Harris, its 2016 Champion of Energy Efficiency in Buildings for outstanding achievement and leadership in the energy efficiency field. The Association of Energy Services Professionals recognized Energy Trust's Path to Net Zero offering with an Outstanding Achievement in Non-Residential Program Design and Implementation award. Energy Trust received a Clean Energy States Alliance 2016 State Leadership in Clean Energy Award for helping irrigation districts and the farmers they serve develop modern irrigation systems that can generate hydropower.

- **Staff gained insights to better engage and serve Oregon's increasingly diverse population** of customers, contractors and employees, as part of Energy Trust's Diversity Initiative. Energy Trust completed focus groups on energy decision-making in small businesses and at home with representatives from Asian, African American and Latino communities. Another set of focus groups was completed with age-diverse rural residents and small business decision-makers. In addition, staff vetted translation services to improve resources for English language learners.
- **In 2016, 225 new trade and program allies joined Energy Trust's Trade Ally Network**, bringing the total number of allies to 2,450, including 200 trade allies, five design allies and 20 real estate allies. To better engage and support allies, staff held workshops in smaller markets to engage small businesses, revised and improved bi-annual trade ally forum events and maintained seven program-specific monthly newsletters with trade ally updates and tips.
- **Energy Trust competitively rebid its Existing Buildings Program Management Contractor** contract, selecting ICF International to manage the Existing Buildings program from January 1, 2017, to December 31, 2019, with two optional one-year extensions. Energy Trust follows best practice to periodically bid out contracts to ensure effective service delivery and value for utility customers.
- **Energy Trust competitively re-bid two contracts to provide program delivery services for industrial lighting and smaller, standard industrial and agricultural measures delivered through trade allies**. Evergreen Consulting and Cascade Energy were selected to serve as Production Efficiency Program Delivery Contractors under the same contract terms as those for the Existing Buildings Program.
- **Energy Trust outlined a path to consolidate its three residential programs into one program** delivered through a single program management contract on January 1, 2018. The consolidated residential program will align the cost of program delivery to the value of expected energy savings resource in the next five years, maintain Energy Trust's third-party program management approach, and increase management and delivery flexibility to reach more customers and respond to new opportunities. In addition to one PMC, staff may pursue flexibility by adding one or more additional contracts with PDCs. Staff will release a request for proposals for PMC and PDC services in 2017.
- **Energy Trust submitted a summary of its demand management activity to the OPUC**, including information about the value of current program impacts, data and tools needed to link utility grid objectives to specific Energy Trust actions, and possible complementary pilots to meet grid optimization objectives to be developed in coordination with utilities. Efforts in process or under consideration at year end include a Nest thermostat promotion with PGE, a demand management pilot for Pacific Power, quantifying peak natural gas savings with NW Natural and a heat pump water heater pilot.
- **Staff improved Energy Trust's annual processes for changing offerings and incentives**. Every January, Energy Trust introduces new and modified offerings and incentives that must be updated in application forms, IT systems, and web and print communications, in coordination with multiple Energy Trust groups, PMCs, PDCs and trade allies. Sequencing and streamlining these cross-organizational processes will free up staff time to deliver programs and services.

D. Revenue and expenditure results

- **Overall public purpose revenue plus incremental electric revenue from SB 838 totaled $148.9 million for 2016,** 2 percent below what was budgeted, and nearly $4.5 million more than in 2015.
- **2016 expenditures totaled $183.8 million**; of which, $109.2 million or 59 percent was for incentives, compared to $95.2 million and 58 percent in 2015.

- **As intended, Energy Trust used utility-specific program reserves** to meet expenses in excess of revenue receipts, continuing to draw down program reserves in agreement with the OPUC and the utilities. By year-end, Energy Trust reserves were close to targeted levels.
- **2016 electric efficiency expenditures** were 1 percent below budget.
- **2016 gas efficiency expenditures** were 3 percent below budget.
- **2016 renewable energy expenditures** were 5 percent below budget.

III Program and operations activity

A. Commercial sector highlights

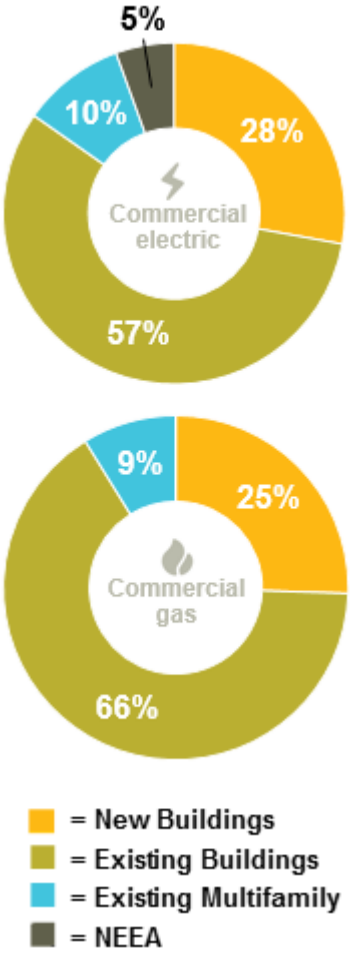
- **The Commercial Sector exceeded goals in all utility territories**.
- **Strong electric and gas savings** were supported by Existing Buildings lighting upgrades and custom projects, as well as new commercial construction.
- **Existing Buildings and New Buildings programs developed strong pipelines of K-12 school projects** expected to complete in 2017, driven by rural outreach efforts. Many schools pursued state bond funding, highlighting expected energy and cost reductions from improvements.
- **Savings from Energy Trust investment in NEEA** activities comprised approximately 5 percent and 6 percent of the sector's results in PGE and Pacific Power territories. Savings were from building code improvements, working with distributors and manufacturers to encourage stocking of efficient commercial lighting, and retrocommissioning, a process for ensuring that a building's systems function according to their design.

Existing Buildings

The Existing Buildings program offers energy-efficient improvements for existing commercial buildings of all sizes. Incentives are available for custom projects, including capital upgrades and operations and maintenance improvements; standard upgrades; lighting upgrades; and energy management offerings such as Strategic Energy Management, with incentives, tools, training and technical assistance to help customers reduce energy use through behavioral and operations improvements.

- **Lighting made up the bulk of electric savings**, followed by custom projects, especially for HVAC controls and HVAC upgrades. Standard projects—such as grocery projects and data center equipment upgrades—and commercial Strategic Energy Management participation also contributed significant electric savings.
- **Largely due to strong response to Energy Trust's LED offerings,** Existing Buildings achieved record electricity savings from lighting projects in 2016. **More than 80 percent of Existing Buildings lighting upgrades featured LEDs**, including upgrades to streetlights and case lighting in grocery stores.
- **Custom projects were the biggest contributor to gas savings**, primarily from HVAC controls and heat recovery systems. Standard projects also contributed gas savings, largely from foodservice equipment, boilers and furnaces, followed by commercial SEM. Gas savings were bolstered by an increase in gas incentives implemented in late 2015 and carried into 2016, and a bonus for foodservice equipment upgrades in Q1 2016.

Commercial sector savings



80 PERCENT OF EXISTING BUILDINGS LIGHTING UPGRADES FEATURED LEDS

- **Existing Buildings completed 4,865 projects and enrolled a record 5,000 projects** by engaging businesses through regional outreach, expanding the Trade Ally Network and targeting offerings such as direct installation of lighting for small businesses. The average project size declined, as many of the largest energy-efficiency projects have been completed.
- **Existing Buildings recognized electric savings from its first Pay for Performance Pilot project**. The program developed an expanded Pay for Performance offering to launch in 2017, with savings expected in 2018. The Pay for Performance offering for commercial customers provides incentives for capital and operations and maintenance improvements over a multiyear period to help achieve additional energy savings for more comprehensive projects.
- **Energy Trust supported customers subject to the City of Portland's Energy Performance Reporting Policy**, effective as of Q1 2016. Resources provided include support for the city's help desk service, a series of ENERGY STAR Portfolio Manager® trainings and education for Energy Trust retrocommissioning customers that use ENERGY STAR Portfolio Manager.
- **Staff identified Existing Buildings and Existing Multifamily projects eligible for the Multnomah County Property Fit initiative** (formerly Commercial Property Assessed Clean Energy, CPACE), and will help these customers initiate energy-efficiency upgrades. Started in Q3 2015, the two-year Multnomah County Property Fit initiative pilot provides 100 percent of funding to commercial property owners in Multnomah County who complete comprehensive energy-efficiency and renewable energy projects, with long-term loans from the Portland Development Commission to be repaid through energy savings or electricity production.
- **Energy Trust supported 52 commercial Strategic Energy Management participants** in Portland, Salem and Southern Oregon, and recruited an additional 17 customers to participate in 2017 in Portland and Central Oregon.

4,865
EXISTING BUILDINGS PROJECTS COMPLETED

5,000
EXISTING BUILDINGS PROJECTS ENROLLED

52
COMMERCIAL SEM PARTICIPANTS

Existing Multifamily

The Existing Multifamily program serves existing multifamily buildings with two or more units, including market-rate housing, affordable housing, homeowners associations, individual unit owners, and assisted living and campus living facilities. The program offers standard incentives for water heaters, HVAC equipment, weatherization, appliances and foodservice equipment; free in-unit installation of LEDs, showerheads and faucet aerators and distribution of advanced power strips; custom incentives for capital improvements; incentives for lighting upgrades in common areas; and incentives paid to distributors to reduce costs of efficient lighting and equipment for customers.

- **Similar to recent years, the largest portion of electric and gas savings consisted of in-unit installation** of LEDs, showerheads and faucet aerators and distribution of advanced power strips. Common-area lighting projects

and standard upgrades grew as a portion of savings compared to recent years, attributed to outreach and development of new standard measures.

- **With Oregon's growing population and historically low multifamily vacancy rates**, property managers had less motivation to invest in large capital improvements and instead selected fast projects with minimal disruption to tenants.
- **Energy Trust completed nearly 250 projects at affordable housing properties**, following continued engagement and outreach.
- **Existing Multifamily worked with the Portland Water Bureau to complete design of a water submetering pilot to be delivered in 2017**. The pilot will evaluate energy and water savings from installing individual water meters for tenants in master-metered buildings.
- **Energy Trust completed a showerhead flow-rate study in multifamily properties**, which found that flow rates of pre-existing and replacement showerheads in multifamily properties were significantly lower than the ratings as labeled, resulting in substantial drop in savings in 2017.
- **A study for tier 1 advanced power strips concluded** that persistence savings are lower than expected, reducing the savings Energy Trust can claim for these measures. Tier 1 advanced power strips shut down peripheral entertainment system devices, such as DVD players, when televisions are turned off. Energy Trust also launched a study on tier 2 advanced power strips, expected to complete in 2017. Tier 2 advanced power strips can sense when televisions are not in use through infrared remote signal sensors, and will power down both televisions and peripheral devices when not in use.

250

PROJECTS AT AFFORDABLE HOUSING MULTIFAMILY PROPERTIES

New Buildings

The New Buildings program supports design and construction of high-performance commercial buildings and major renovations of all sizes and building types. Staff engage with building owners, developers and design professionals to provide standard prescriptive incentives, market solutions incentive packages and custom incentives. Tailored market solutions incentive packages help businesses make quick decisions and achieve deeper energy savings when constructing small restaurant, grocery, multifamily, office, school or retail buildings less than 70,000 square feet.

- **The largest contributor to electric savings was data centers**, followed by multifamily buildings, warehouses and offices.
- **Multifamily new construction comprised nearly one-half of gas savings**, followed by K-12 schools, hotels and grocery stores.
- **New Buildings completed a record 426 projects in 2016**, a 28 percent increase from 2015. Also a record, the program enrolled 630 projects in 2016, a 5 percent increase from 2015, primarily due to a robust construction market.
- **More than one-half of all new projects were outside of the Portland Metro area**. The program increased the number of outreach staff serving

426 NEW BUILDINGS PROJECTS COMPLETED

rural areas with robust new construction markets, including Central Oregon, Eastern Oregon and Douglas and Coos counties.

- **Energy Trust supported about 20 affordable multifamily housing projects** in 2016, and demand for affordable housing is expected to grow in the next few years.
- **New warehouse and distribution center construction grew in 2016**, and is expected to see further growth in Portland despite rising rents as the city is viewed as a prime West Coast distribution hub. Large land parcels for development are located at the fringe of the Portland Metro area.
- **Energy Trust continued Oregon's leadership in net-zero construction, with six Path to Net Zero projects completed** in 2016 and 44 projects currently enrolled. The Association of Energy Services Professionals recognized Energy Trust's Path to Net Zero offering with an Outstanding Achievement in Non-Residential Program Design and Implementation award.
- **New Buildings continued to drive change in the market through training and education** for customers and trade allies, including 54 Lunch and Learn events with 520 participants, six Building Energy Simulation Forums with 290 participants, three Allies for Efficiency trainings with 280 participants and three Allies for Efficiency 2.0 trainings with 170 participants.
- **As a capacity-building approach to grow market adoption of design strategies, Energy Trust developed and launched two Net Zero Fellowships** to be awarded in 2017. Two 12-to-18-month fellowships are available to support research about technology, economic benefits, market barriers and community-based net-zero projects. Fifteen applications were received from a diverse group including contractors, mechanical engineers, architects, university professors, energy consultants, developers, building science engineers, green building consultants and renewable energy experts.

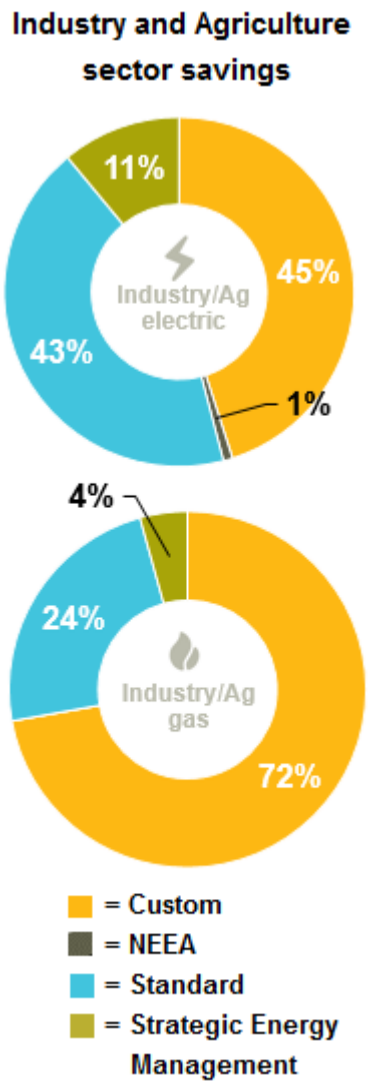
SUPPORTED 20 AFFORDABLE MULTIFAMILY HOUSING PROJECTS

6

PATH TO NET ZERO PROJECTS COMPLETED

B. Industry and agriculture sector highlights

- **The industry and agriculture sector exceeded its goal for NW Natural territory and fell short of goals in all other utility territories**.
- **The sector saved less energy from custom projects**, impacting achievement in PGE, Pacific Power and Cascade Natural Gas territories. Savings were also impacted by fewer industrial Strategic Energy Management participants than expected.
- **To boost savings at mid-year, Energy Trust launched a targeted incentive bonus** for some custom projects in PGE and Cascade Natural Gas territories and increased marketing for operations and maintenance projects in all territories. Between September and December, 29 projects completed and received the bonus, which influenced the rapid implementation of 10 newly identified projects and reduced the expected attrition rate of other projects that were already in the pipeline.
- **Savings from NEEA activities comprised approximately 1 percent** of the sector's results in PGE and Pacific Power territories. Savings in 2016 were primarily from a previously funded initiative to improve awareness of and establish standards for efficient motors. A smaller portion of savings are from efficient lighting and an industrial refrigeration operator certification initiative.



Production Efficiency

The Production Efficiency program offers technical assistance and incentives to industrial and agricultural businesses, including incentives for custom projects, standard lighting and equipment upgrades delivered by trade allies, and an industrial Strategic Energy Management offering to help customers achieve persistent energy savings through behavioral and operations and maintenance improvements.

- **Trade ally delivered projects for standard equipment such as industrial lighting, irrigation and small compressed air accounted for more than one-half of electric savings**, with roughly one-third from custom projects and the remainder from industrial Strategic Energy Management engagements.
- **Custom projects provided more than two-thirds of gas savings**, with roughly one-quarter from standard projects and the remainder from industrial SEM.
- **Production Efficiency completed 1,400 projects in 2016, roughly the same as in 2015**. Average savings per project declined by roughly 18 percent, following the sector's strategy to increase participation from small- to medium-sized facilities.

1,400
PRODUCTION EFFICIENCY PROJECTS COMPLETED

- **LED technology increased as a portion of lighting** savings, comprising 90 percent of lighting savings in 2016 compared to 70 percent in 2015. Energy Trust provided customers with information on the benefits of lighting upgrades, and the majority of customers retrofitting their lighting systems selected LED technology. The program continued to focus on providing lighting expertise to industrial customers as many still have older lighting systems.
- **The program launched discounted LEDs at retail**, a strategy to help more small industrial customers benefit from energy-efficient lighting. Incentives are provided directly to distributors and the cost savings are passed onto customers.
- **Savings from custom electric projects were lower than expected.** Energy Trust will analyze the market for custom efficiency projects to understand the root causes of the shortfall.
- **Energy Trust helped 12 state-licensed cannabis production facilities save energy** through efficient lighting, and developed a strong pipeline of projects for 2017, including multiple non-lighting efficiency upgrades.
- **The program launched and recruited 15 participants for a new Continuous SEM offering** that provides ongoing engagement, support and performance-based incentives for graduates of first-year SEM offerings. Continuous SEM participants are highly motivated to continue energy-saving strategies, having achieved success through standard SEM.
- **Seven participants completed the first Klamath Falls industrial SEM cohort**, with industries ranging from wood products to water treatment to laundry. Production Efficiency launched a new industrial SEM cohort in Roseburg with nine participants expected to recognize savings in 2017.
- **The program engaged more than 350 farmers around the state** to invest in efficient irrigation upgrades. In the Klamath River Basin, this strategy was reinforced through coordination with Sustainable Northwest, leveraging the nonprofit's other local efforts to promote energy-efficiency opportunities and program participation to 50 landowners.

12

PROJECTS AT CANNABIS PRODUCTION FACILITIES

15

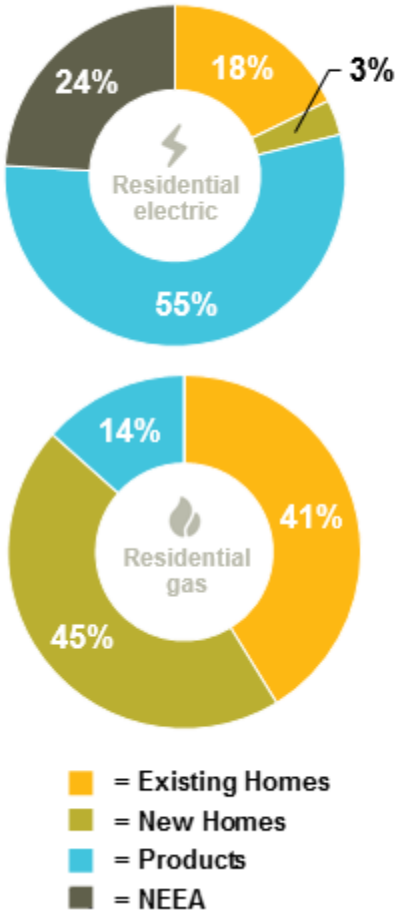
NEW PARTICIPANTS IN CONTINUOUS SEM

350 FARMERS ENGAGED AROUND THE STATE

C. Residential sector highlights

- **The residential sector exceeded goals in all utility territories**, driven by retail LED sales, growth in the new home construction market and promotion of Energy Saver Kits
- **Energy Trust expanded incentives for smart thermostats from Nest to EcoBee3**, and smart thermostats emerged as a growing source of savings through scheduling optimization and behavior functions.
- **Launched in Q1, a midstream incentive for intermittent ignition gas fireplaces resulted in strong savings**, with costs and savings shared across Existing Homes and New Homes programs. The sector laid the groundwork for additional midstream incentives provided to distributors and retailers, with cost savings passed onto customers.
- **Staff outlined a path to change its program delivery structure in 2018 to reduce costs, attract new participants and identify new energy-saving strategies** in the face of continued low natural gas costs, tighter codes and standards that reduce the amount of energy savings Energy Trust can claim for upgrades, and fewer savings from measures that are anticipated to be rapidly adopted in coming years, such as LEDs. The decision followed an assessment of alternate potential program approaches, analysis to understand the most effective way to address challenges and stakeholders engagement.
- **Energy Trust continued coordination with PGE on demand management efforts** to reduce energy use during peak periods, including incorporating efficiency analysis into PGE's Time of Use Pilot. Energy Trust also supported enrollment of customers with Nest thermostats in PGE's Rush Hour Rewards program, and collaborated with PGE to ensure there were no customer enrollment conflicts between the utility's program and Energy Trust's Seasonal Savings pilot. Energy Trust offered incentives for installing qualifying smart thermostats, which can reduce energy use during periods of peak demand by cycling off forced air furnaces, air conditioners and heat pumps. Additional demand management pilots with Pacific Power and NW Natural were in process or under consideration by year-end.
- **Savings from NEEA activities comprised 24 percent and 25 percent** of the sector's savings in PGE and Pacific Power territories, respectively. Savings were from previously funded efforts on battery charger standards, energy-efficient televisions and residential building code improvements. Ductless heat pump, heat pump water heater and super-efficient dryer initiatives also delivered savings in 2016.

Residential sector savings



Existing Homes

The Existing Homes program serves single-family homeowners, renters and owners of existing manufactured homes with energy-saving recommendations, referrals to qualified trade ally contractors, cash incentives for heating and water heating equipment, smart thermostats, insulation and windows, and LEDs,

showerheads and faucet aerators delivered through kits. Enhanced Savings Within Reach incentives are available for moderate-income residents.

- **Efficient LEDs, showerheads and faucet aerators delivered through kits provided the majority of electric savings**, followed by smart thermostats, ducted and ductless heat pumps, and weatherization.
- **Gas savings consisted primarily of showerheads and faucet aerators delivered through kits**, with additional savings from smart thermostats, gas hearths, gas furnaces and weatherization.
- **Roughly 750 moderate-income homeowners and renters installed efficient gas furnaces** in 2016, more than three times the number in 2015. This success follows promotion and outreach to trade allies for an incentive for gas furnaces in single-family rental homes and the introduction of a financing offer with on-bill loan repayment for moderate-income Savings Within Reach customers.
- **Existing Homes reduced costs of delivering Energy Saver Kits** through targeted online marketing and utility collaboration, helping boost savings and maintaining a key outreach tool for new participants.
- **Energy Trust launched two Nest Seasonal Savings pilots** to test whether additional control capabilities of Nest thermostats can further reduce energy use during summer and winter seasons for participating customers with existing Nest thermostats connected to forced air furnaces, heat pumps or air conditioners. Nest thermostats reduce energy use by making small, gradual temperature adjustments based on occupant habits and preferences.
- **Continued promotion with the Portland Trailblazers provided an outreach tool** for residential customers, enabling the program to expand participation.
- **Staff provided technical and market expertise to the City of Portland** for its proposed home energy score ordinance, which was approved by the city council and will require sellers of single-family homes to obtain and disclose a home energy performance report starting in 2018.
- **Staff worked with the Oregon Department of Energy to identify a single scoring metric for existing homes.** The U.S. Department of Energy's Home Energy Score was chosen to ensure uniformity with other utilities in Oregon and around the nation. Energy Trust will discontinue EPS for Existing homes upon full release of the Home Energy Score in 2017.

750

MODERATE-INCOME HOMEOWNERS AND RENTERS INSTALLED EFFICIENT GAS FURNACES

LAUNCHED TWO NEST SEASONAL SAVINGS PILOTS

New Homes

The New Homes program works with trade ally builders, subcontractors and verifiers to construct energy-efficient homes that exceed code through EPS-rated homes and prescriptive incentives for individual equipment.

- **New EPS homes contributed 99 percent of the program's electric savings**, with a small remainder from individual equipment installations. Builders can receive cash incentives for new homes constructed to EPS requirements, indicating low energy consumption, utility costs and carbon footprint.
- **Market transformation accounted for 56 percent of gas savings**, with 39 percent from EPS homes and the remainder from individual equipment installations. Market transformation reflects the program's influence on 2008 and 2011 updates to Oregon's residential energy code, guiding builders who do not work directly with Energy Trust to incorporate energy-efficient building techniques for the benefit of customers.
- **EPS homes reached 38 percent of market share, with more than 3,300 home ratings completed in 2016—30 percent more than 2015**. EPS influenced builders to construct homes with greater levels of efficiency than compared to 2015, with savings per home increasing 45 percent compared to 2015 due to greater adoption of efficient HVAC and water heater technologies.
- **Energy Trust engaged more builders to exceed energy-efficiency code in an active construction market**, signing on 61 new builders and six new verifiers to reach a total of 217 builders and 25 verifiers. Trade ally verifiers provide technical guidance and inspection to home builders, ensuring that homes rated with EPS save energy through energy-efficient windows, HVAC, appliances and weatherization.
- **Energy Trust completed its 10,000th EPS home to date** by engaging residential builders around the state, including in Central and Southern Oregon. New home construction markets were strongest in the Portland Metro and Bend areas.
- **Energy Trust continued support for the Columbia Basin Student Homebuilders Program** as students broke ground on a second home, supported by profits from the sale of the program's first student-built home in 2015. The program includes onsite training for Hermiston High School students on EPS, building science fundamentals, thermodynamics, insulation, air sealing and duct sealing.
- **Staff met with City of Hillsboro staff to discuss the city's sustainability goals for development of new homes**, with activity expected to result in

EPS HOMES REACHED 38 PERCENT OF MARKET SHARE

10,000

EPS HOMES COMPLETED SINCE 2009

2017. New Homes, Solar and New Buildings programs met with and provided support to city staff and developers in assessing opportunities to achieve energy savings and new renewable generation throughout Hillsboro.

- **Staff analyzed and updated the performance-based incentive structure for EPS homes**, which will aid in reporting and forecasting in 2017.

Products

The Products program offers cash incentives for ENERGY STAR qualified products, including lighting, clothes washers and showerheads, and for recycling old refrigerators, freezers and clothes washers. The program offers midstream incentives for select measures, with incentives provided directly to distributors and retailers and cost savings passed onto customers. The program also provides energy-saving kits to food pantries to deliver to their clients, and distributes showerheads through water bureaus and districts. In addition, the program encourages the sale of energy-efficient new manufactured homes.

- **Retail lighting purchases contributed 88 percent of electric savings, primarily from LEDs**. The remainder of electric savings were from recycling of refrigerators, freezers and clothes washers; showerheads purchased in stores; and lighting and showerheads given away through food banks and water bureaus. New manufactured homes, smart thermostats, appliances and water heaters purchased in stores each contributed less than 1 percent of electric savings.
- **Efficient showerheads contributed 78 percent of gas savings**, primarily through retail purchases and also distributed with faucet aerators through food banks and water bureaus. Smart thermostats provided 15 percent of savings, with a small remainder from retail appliance purchases, new manufactured homes and gas water heaters.
- **Energy Trust influenced consumers to buy nearly 3.8 million ENERGY STAR LEDs, a 60 percent increase over 2015**, through incentives and education, effective promotions with manufacturers and retailers, and expanding relationships with retailers and manufacturers. Sales were bolstered by competitive prices, increased availability and updated certification criteria for ENERGY STAR bulbs to include lower-cost LEDs. These lower-cost LEDs last for 15,000 hours rather than the previous minimum of 25,000 hours.
- **The program made it easier for new and rural customers to purchase discounted LEDs and showerheads** through eight new retail chains and 98 new associated and independent stores, expanding into 10 rural towns

88% OF ELECTRIC SAVINGS FROM LIGHTING

78% OF GAS SAVINGS FROM SHOWERHEADS

3.8

MILLION LEDS PURCHASED

including Merrill, Myrtle Point, Joseph, King City, Philomath, Lakeview, Monmouth, Sweet Home, Coquille and Enterprise.

- **Energy Trust provided more than 5,800 Carry Home Savings kits to moderate-income customers** through food pantries and social service agencies, including 16 new pantries in Corvallis, Astoria, Warrenton, Brownsville, Salem, Eugene and Redmond.
- **The program provided 2,400 efficient showerheads through 16 water agencies**, including five new agencies serving customers. Kits were also provided to moderate-income customers through water bureaus and agencies, including seven new agencies in Prineville, Jefferson, Monmouth, Independence and Dallas.
- **Energy Trust removed and recycled 10,700 old, inefficient refrigerators and freezers from homes** in 2016, bringing the total recycled to 125,000 since 2008. Given Energy Trust's success and increased federal standards requiring refrigerators built after 1993 to be more efficient, Energy Trust incentives are no longer needed to influence consumers to remove energy-wasting appliances from their homes and were discontinued at year-end.

5,800

CARRY HOME SAVINGS KITS PROVIDED TO MODERATE-INCOME CUSTOMERS

10,700 OLD REFRIGERATORS RECYCLED

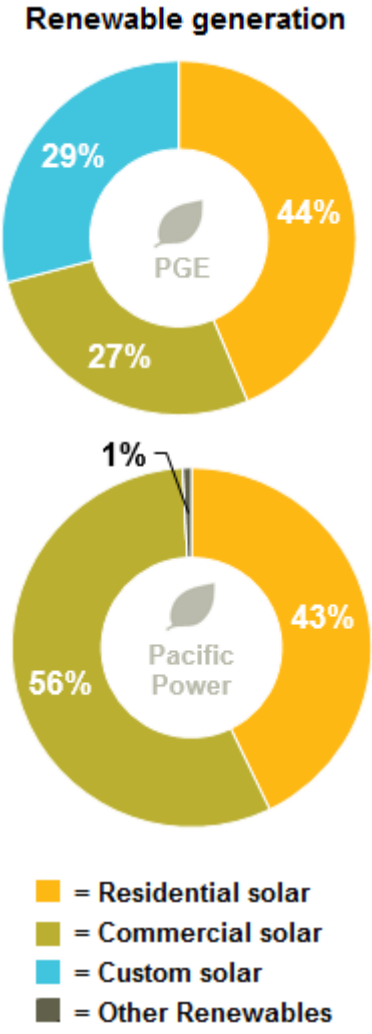
D. Renewable energy sector highlights

- **The sector achieved 2.3 aMW of new, standard, net-metered generation,** exceeding the annual targets for both utility territories and the annual OPUC performance measure of 1.6 aMW.
- **The sector fell short of total goal** due to completion of two custom solar projects delayed to 2017, despite record success in standard solar installations. It is not unusual for delays to occur with large, complex projects, which can significantly impact the sector's achievement of its overall generation.

Solar

The Solar program aims to create a vigorous and sustainable market for solar energy by offering cash incentives that lower above-market costs for solar projects, educating consumers, creating and enforcing quality standards and ensuring a robust network of qualified trade allies. Staff review incentive levels regularly and gradually reduce them to manage budget and respond to decreases in solar costs. The Solar program supports installation of standard solar systems on residential and commercial properties, and also large custom projects when funding is available.

- **The program installed more standard solar capacity and generation in 2016 than in any other year**, while monitoring and adjusting incentives to support more solar installations when customer interest was high.
- **Surpassing a major milestone, Energy Trust supported its 10,000th solar system to date**, including at residential and commercial sites.
- **The 2.9-MW Steel Bridge solar project in Willamina reached commercial operation**, and Energy Trust made the first of three incentive payments.
- **Energy Trust** supported installation of a record 1,200 customer-owned residential solar systems in 2016, while third-party leasing options largely withdrew from the Oregon market. This reflects a nationwide trend away from leases and toward loans.
- **Energy Trust's board of directors approved incentives for a 1.9-MW solar system at the Rogue Valley International—Medford Airport**. The project will help the airport achieve net-zero energy use and is expected to complete construction by 2018.
- **Staff supported community and media events celebrating completed solar projects,** including a 150-kW solar system at the Oregon Army National Guard's facility in Pendleton, a 123-kW carport-style solar system at the Cultural Center for the Confederated Tribes of the Umatilla and a 35-kW solar system at Ireland Trucking's Myrtle Creek headquarters. The installation on the Umatilla Reservation has the capability to be expanded to 250 kW.
- **Staff attended the Rocky Mountain Institute's invitation-only Electric Innovation Lab Accelerator**, which convenes national thought leaders to address barriers to deployment of distributed resources in the U.S. electricity



1,200 CUSTOMER-OWNED SOLAR SYSTEMS INSTALLED

sector. Together with staff from PGE and the OPUC, Energy Trust began working on a pilot to learn about utility and customer benefits of customer-sited solar-plus-energy storage systems and better understand the link between grid reliability and resilience.

- **Energy Trust joined efforts to expand the benefits of solar generation to low- and moderate-income customers**, in collaboration with Clean Energy States Alliance and the U.S. Department of Energy's SunShot program. Staff collaborated with utilities, community groups and state agencies to plan activities for 2017 and beyond, including **workshops for low-income residents around the state**.
- **Costs for solar systems continued to decline**. For systems installed in 2016, the average residential solar system costs $3.94 per watt, the average small commercial solar system (less than 50 kW) costs $3.42 per watt and the average large commercial solar system (50 to 500 kW) costs $2.93 per watt.
- **Staff completed an impact evaluation indicating that solar systems supported by Energy Trust generated more energy than estimated**, with realization rates of 106 percent for commercial systems and 122 percent for residential systems. Results of the evaluation will inform Energy Trust's future estimates of solar generation.
- **Energy Trust connected more than 1,500 customers with solar trade allies through an online bid request form**, a 37 percent increase over 2015, meeting customer demand for online self-service tools and reducing customer acquisition costs for trade allies.
- **Energy Trust hosted a summit for solar trade allies** in coordination with the annual Oregon Solar Energy Conference in Portland, providing financial management training and marketing resources to help them reduce non-installation soft costs. More than 40 trade allies attended.

PLANNED SOLAR WORKSHPS FOR LOW-INCOME RESIDENTS

1,500

CUSTOMERS CONNECTED WITH SOLAR TRADE ALLIES ONLINE

Other Renewables

The Other Renewables program provides project development assistance and incentives that lower above-market costs for projects that generate renewable energy from hydropower, biopower, wind and geothermal resources. Project development assistance supports early-stage development and helps build a pipeline of future renewable energy installation projects. In 2016, staff focused on projects that provide a wide range of benefits, including biogas projects generating energy from anaerobic digestion of organic waste and hydropower projects at irrigation districts.

- **The program completed a 0.01-aMW hydropower project at Spaur Ranch in Wallowa County** and participated in a ribbon cutting for the new system. The second on the ranch, the hydropower system will offset energy use from an auto repair business operated by the ranch.
- **The board approved an incentive for a 0.37-aMW Opal Springs hydropower project at Deschutes Valley Water District near Madras**, expected to complete in 2019.

- **The program dedicated incentive funds for five 2.1-kilowatt wind turbines** in Independence and a 10-kW wind project in Coos Bay. All projects are expected to reach commercial operation in 2017.
- **Staff developed a record pipeline of 48 hydropower, biopower, geothermal and wind projects receiving project development assistance**, up from 29 recipients in 2015. Project development assistance is early stage support to help potential renewable energy projects overcome development barriers. For more information about Energy Trust's project development assistance activities, see Appendix 3.
- **Irrigation system assessments continued at 14 districts** through Energy Trust's irrigation modernization initiative with Farmers Conservation Alliance. Initial results indicated hydropower potential in almost every district. The collaborative irrigation modernization strategy leverages the wide range of benefits irrigation modernization projects can provide, including energy generation, energy and water savings and investment in rural communities. An additional 12 irrigation districts expressed interest in participating in 2017.
- **Energy Trust received a Clean Energy States Alliance 2016 State Leadership in Clean Energy Award**. The national award recognized the coordinated and comprehensive approach by Energy Trust and Farmers Conservation Alliance to help irrigation districts and the farmers they serve develop modern irrigation systems that can generate hydropower and reduce energy use.
- **Staff released a request for qualifications seeking consultants to evaluate the performance of operating biogas and irrigation hydropower** projects that received Energy Trust installation incentives, with two projects slated for evaluation in 2017. Best practices and opportunities for improved performance will be documented and shared with proposed projects, and will improve the accuracy of Energy Trust's future project analysis.
- **Staff shared expertise with local and national audiences**, including through a national webinar on Energy Trust's irrigation modernization initiative for the Clean Energy States Alliance, a presentation to the Oregon Association of Clean Water Agencies on the energy generation options available at wastewater treatment plants, and a presentation to the Oregon Senate Committee on Veterans and Emergency Preparedness on the resiliency benefits of in-conduit hydropower plus other small- and community-scale renewable energy and energy-efficiency projects.

48

HYDROPOWER, BIOPOWER, GEOTHERMAL AND WIND PROJECTS IN PIPELINE

RECEIVED CLEAN ENERGY STATES ALLIANCE 2016 STATE LEADERSHIP IN CLEAN ENERGY AWARD

E. Internal operations highlights

Communications

- **Received 944,000 website visits in 2016, a 9 percent increase** over the 858,000 website visits in 2015, reflecting Energy Trust's increasing use of online applications and forms, email newsletters, online advertising and social media.
- **Distributed 22 press releases in 2016**, featuring awards, transition to a new executive director, program promotions, completed energy-efficiency and renewable energy projects around the state, results and customer benefits.
- **Garnered 362 news stories about Energy Trust programs, services and customer benefits in print and broadcast** with a media value of $207,000—what it would have cost to purchase the equivalent advertising space and air time—as a result of media outreach and responses to reporter inquiries.
- **Redesigned Energy Trust's website**, making it easier for customers to navigate and find information and incentive forms. The website is also more visually engaging and optimized for phones and tablets. In 2016, **one-half of all web traffic was from mobile devices**, up from 40 percent in 2015.
- **Launched a new mobile-optimized Energy Trust blog for news and featured content** organized by customer type.
- **Distributed monthly and quarterly email newsletters for stakeholders and customers**, with higher readership than compared to industry average.

944,000
WEBSITE VISITS

362
NEWS STORIES ABOUT ENERGY TRUST

50% OF ALL WEB TRAFFIC FROM MOBILE DEVICES

Customer service

- **Received 20,500 calls to Energy Trust's main hotline in 2016, 15 percent fewer** than the 24,300 calls received in 2015.
- **Received and responded to 1,830 email inquiries from info@energytrust.org, a 4 percent increase** from 1,750 emails received in 2015.
- **Received and addressed eight complaints** that could not be easily resolved by a call center representative and required follow up from Energy Trust staff. This compares to 18 complaints received in 2015.
- **Launched a new Interactive Voice Response System**, the automatic greeting and navigation instructions that customers hear when they call Energy Trust's main phone number. The improved system helps customers find the right information 20 percent faster on average, offers a more consistent customer experience, saves time for both customers and Energy Trust call center staff, and improves accuracy of tracking call volume.

20,500
CUSTOMER CALLS RECEIVED

Trade and program allies

- **Provided education and networking opportunities for 500 trade allies at forums and events** in Bend, Coos Bay, Medford, Pendleton and Portland.

500
TRADE ALLIES ATTENDED FORUMS AND EVENTS

- **Added 225 new allies to the network**, including 200 trade allies, five design allies and 20 real estate allies.
- **Provided $382,000 in business development fund reimbursement** to support trade ally co-branded marketing and advertising. In 2016, 134 trade allies took advantage of business development fund opportunities.
- **Provided ongoing support for trade allies** through webinars, trainings and a monthly email newsletter.
- **Replaced the paper trade ally application process with an online trade ally application** to allow contractors to join the Trade Ally Network. The online enrollment tool makes enrollment faster and easier for trade allies and reduces Energy Trust staff time to process applications by two hours per week on average.

225
TRADE ALLIES ADDED

General outreach

- **Expanded awareness about Energy Trust services through presentations** to the Klamath Rental Owners Association, the League of Oregon Cities, Douglas County Smart Energy group, Pendleton City Council and Umpqua Basin Economic Alliance, and at events including the Pendleton Distinguished Citizens Banquet, the annual Snake River Economic Development Alliance Breakfast and the Making Energy Work for Rural Oregon symposium in Roseburg.
- **Developed relationships with stakeholders and customers by attending meetings and events**, including town hall meetings in Eastern Oregon, the Washington County Air Quality committee, tribal events, the Greater Rogue Valley Multicultural Fair, an Oregon Rural Development Council event, Pacific Power Roadshows, the Community Action Partnership of Oregon symposium and the Regards to Rural Conference in Ontario. In addition, staff attended meetings of the Oregon Department of Environmental Quality's Woodsmoke Workgroup, Lakeview County Resources, Pendleton Progress Board, Restore Pendleton Committee, Northeast Oregon Home Builders Association, the Oregon Manufacturing Innovation Center in Scappoose, Business Oregon's Infrastructure Finance Authority, the Northeast Oregon Economic Development District, Oregon Leadership Summit, Oregon Business Association Statesman Dinner and the Oregon Global Warming Commission meeting.
- **Provided information about Energy Trust services through meetings** with Senators Ron Wyden and Jeff Merkley; the governor's energy policy advisor; state and local elected officials; the Hispanic Chamber of Commerce; Blue Mountain Community College; Douglas County Community Action Agency; Confederated Tribes of the Umatilla Indian Reservation; Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians; several regional rental owners associations; and Causa, a Salem-based nonprofit that supports Latino immigrants.
- **Helped Hood River County acquire an energy and sustainability coordinator** through AmeriCorps Resource Assistance for Rural

Environments program. Local governments and Energy Trust contributed funding to create the position, which will lead to a comprehensive vision and energy action plan for Hood River. The position was an outcome of the Making Energy Work for Rural Oregon series, hosted by Sustainable Northwest, which resulted in AmeriCorps volunteer placements in other communities including Talent, Roseburg and Pendleton.

IT

100,000
CUSTOMER PROJECTS PROCESSED

- **Processed 100,000 customer projects in Energy Trust systems**, including 76,000 submitted through web applications, slightly fewer than in 2015.
- **Continued investments in foundational IT system improvements** to help anticipate program needs and reduce future costs, including:
  - Automated processes for importing utility customer information from utilities, including data scrubbing that improves the quality and reliability of the data.
  - Added new functionality to Project Tracking, Energy Trust's measure and project tracking system, to streamline work for staff and PMC users.
  - Upgraded nightly data update process to a new platform, reducing costs and time needed from four hours to 30 minutes.
  - Upgraded the Customer Relationship Management system (CRM) to a new version, offering new functionality and a streamlined interface for users.
  - Simplified CRM data model to improve accuracy of site data and facilitate reporting.

Planning and evaluation

450
NEW ENERGY-EFFICIENCY MEASURES CREATED

13
EVALUATIONS AND MARKET STUDIES COMPLETED

- **Created 450 new energy efficiency measures and revised 616 measures**.
- **Provided input for Integrated Resource Plan development** to PGE, Pacific Power and NW Natural.
- **Tracked developments for PGE and Pacific Power transportation electrification programs** per SB 1547.
- **Completed and posted 13 evaluations and market studies** on the Energy Trust website.
- **Coordinated with utilities to quantify demand reduction benefits of energy efficiency** and explore how Energy Trust can help utilities meet demand response goals.
- **Updated gas avoided costs** in program and analytical tools for implementation in NW Natural Washington territory in 2017.
- **Implemented new cost-effectiveness tools with updated avoided cost value differentials** by time of day, week and year for gas and electricity. These tools use the load profiles developed for the Northwest Power and Conservation Council Seventh Power Plan, which will allow estimation of utility-specific summer and winter peak demand reductions.

- **Developed a new procedure for developing technical and cost-effectiveness analyses for prescriptive efficiency measures**, increasing efficiency for this common process**.** The new process clarifies roles and responsibilities among planning, program staff and contractors, and is expected to reduce staff time needed to develop new energy efficiency measures.
- **Between August 2015 and August 2016, Energy Trust worked on 17 pilots** at various stages**,** from planning to implementation to evaluation to completion. Pilots help Energy Trust evaluate promising yet uncertain technologies and energy-saving solutions. Pilots focused on Path to Net Zero, ductless heat pumps, Mpower Oregon, Pay for Performance, advanced power strips, cadet energy plus heaters, variable refrigerant flow, luminaire lighting controls, water submetering, prescriptive air sealing with attic insulation, smart thermostats, air sealing, Nest Seasonal Savings and heat pumps in existing manufactured homes.

IV 2016 progress to OPUC performance measures

Each year, the Oregon Public Utility Commission 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 percent of Energy Trust goals as defined in annual budgets. The following OPUC minimum performance measures apply to Energy Trust 2016 results.

Category	Measure	Result
Electric efficiency	PGE: • Save at least 28.6 aMW • Levelized cost not to exceed 3.4 cents/kWh Pacific Power: • Save at least 18.2 aMW • Levelized cost not to exceed 3.5 cents/kWh	PGE: • Exceeded, with 36.5 aMW saved • Within requirement, levelized cost at 2.6 cents per kWh Pacific Power • Exceeded, with 23.6 aMW saved • Within requirement, levelized cost at 2.6 cents/kWh
Natural gas efficiency	NW Natural: • Save at least 4.5 million annual therms • Levelized cost not to exceed 37 cents/therm Cascade Natural Gas: • Save at least 0.40 million annual therms • Levelized cost not to exceed 47 cents/therm	NW Natural: • Exceeded, with 6.2 million annual therms saved • Within requirement, levelized cost at 27 cents/therm Cascade Natural Gas: • Exceeded, with 0.51 million annual therms saved • Within requirement, levelized cost at 33 cents/therm
Renewable energy	• For project and market development assistance report annual results, including number of projects supported, milestones met and documentation of results from market and technology perspective • Obtain at least 1.6 aMW of installed generation of net-metered standard projects including solar and small wind • For non-solar custom projects, the three-year rolling average incentive is not to exceed $25/allocated MWh • For innovative and custom solar projects, report sources of funding for projects and the selection criteria	• In compliance, paid $1,807,019 and committed $2,985,081 in project development assistance to 48 projects, including 36 hydropower, three geothermal, eight biopower and one wind. Additional detail is in Appendix 3. • Exceeded, with 2.3 aMW of installed generation from standard solar projects • Within requirement, with a three-year rolling average incentive per allocated MWh for 2014-2016 of $15.82 • In compliance, dedicated funding to one custom net-metered solar project in Pacific Power territory selected through a request for proposals for solar projects in 2015. Funding came from a 2015 RFP for non-solar projects that had unallocated funds. The project was selected based on

		incentive amount requested and the quality of the project's business plan.
Financial integrity	Receive an unmodified financial opinion from an independent auditor on annual financial statements	In compliance, with an unmodified financial audit opinion for 2016
Administrative/ program support costs	Keep administrative/program support costs below 8 percent of annual revenues	Within requirement, with 2016 administrative and program support costs at 6.2 percent of annual revenues
Staffing expenditures	Total staffing expenditures not to exceed 7.75 percent of total organization expenditures calculated on a three-year rolling average for public purpose funded activities in Oregon	In compliance, with a three-year rolling average staffing cost of 6.6 percent of total organization expenditures for 2014-2016.
Customer satisfaction	Demonstrate greater than 85 percent satisfaction rates for interaction with program representatives and overall satisfaction	Achieved, with a 96 percent satisfaction rate for interaction with program representatives and a 93 percent overall satisfaction rate. Customer satisfaction rates were calculated from telephone surveys of participants soon after project completion. Results for major programs are averaged to determine satisfaction rates. See Appendix 1.
Benefit/cost ratios	Report utility system and societal perspective annually. Report significant mid-year changes as warranted in quarterly reports.	Achieved, see table below.

Benefit/cost ratios

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

2016 Utility Cost and Total Resource Cost by program

Program	Combined Utility Cost Test benefit cost ratio	Combined Total Resource Cost Test benefit cost ratio
New Homes and Products	2.9	4.1
Existing Homes	1.8	2.3
Existing Buildings, including Multifamily	2.1	1.5
New Buildings	2.8	1.7
Production Efficiency	2.2	1.9

V Revenue and expenditure tables[8,9,10]

A. Revenues

Revenues includes public purpose revenue plus incremental electric revenue from SB 838. Incremental revenues are those authorized under SB 838 to support capturing additional cost-effective electric efficiency savings above the amount supported by funding through SB 1149.

Source		Annual actual revenues		Annual budgeted revenues
Portland General Electric	$	36,233,250	$	36,660,651
PGE Incremental	$	41,012,913	$	42,525,000
Pacific Power	$	27,593,801	$	27,664,181
Pacific Power Incremental	$	25,555,840	$	25,902,402
NW Natural	$	13,086,802	$	14,539,218
NW Natural Industrial DSM	$	3,527,053	$	3,215,724
Cascade Natural Gas	$	1,687,981	$	2,114,889
Avista	$	156,000	$	-
Total	**$**	**148,853,640**	**$**	**152,622,065**

Reserves were used to cover expenditures where actual revenues came in under budgeted revenues.

B. Expenditures by utility

Source		Annual actual expenditures		Annual budgeted expenditures
Portland General Electric	$	96,346,463	$	98,538,528
Pacific Power	$	63,519,800	$	64,170,617
NW Natural	$	18,031,151	$	18,197,514
NW Natural Industrial DSM	$	3,531,656	$	3,859,806
Cascade Natural Gas	$	2,253,785	$	2,582,427
Avista	$	87,383	$	-
Total	**$**	**183,770,237**	**$**	**187,348,892**

As intended, Energy Trust used utility-specific program reserves to meet expenses in excess of revenue receipts, continuing to draw down program reserves in agreement with the OPUC and the utilities. By year end, Energy Trust reserves achieved targeted levels for each utility.

[8] Columns may not total due to rounding.
[9] The gas expenditures do not include NW Natural in Washington. These results are available in a separate report on activities for NW Natural in Washington at www.energytrust.org/reports.
[10] All tables include Avista revenue and expenditures; however, Avista is not reflected in the board-approved goals. Goals were approved by the board in December 2015 whereas the addition of Avista for a transition period in 2016 did not occur until February 2016 at the direction of the OPUC.

C. Expenditures by sector and program

			Annual actual expenditures		Annual budgeted expenditures	Budget variance
Commercial	Existing Buildings and Multifamily	$	52,912,454	$	55,242,641	4%
	New Buildings	$	16,416,254	$	16,597,062	1%
	NEEA Commercial	$	2,595,978	$	2,638,145	2%
	Commercial total	**$**	**71,924,686**	**$**	**74,477,848**	**3%**
Industrial	Production Efficiency	$	31,306,250	$	32,613,239	4%
	NEEA Industrial	$	292,003	$	438,632	33%
	Industrial total	**$**	**31,598,253**	**$**	**33,051,872**	**4%**
Residential	Existing Homes	$	19,012,520	$	19,417,606	2%
	New Homes and Products	$	30,355,386	$	28,200,301	-8%
	NEEA Residential	$	4,953,685	$	4,840,174	-2%
	Residential total	**$**	**54,321,591**	**$**	**52,458,080**	**-4%**
	Energy efficiency total	**$**	**157,844,530**	**$**	**159,987,800**	**1%**
Renewables	Solar	$	13,788,934	$	15,023,956	8%
	Other Renewables	$	5,807,850	$	5,630,058	-3%
	Renewable generation total	**$**	**19,596,784**	**$**	**20,654,014**	**5%**
Administration	**Administration**	$	6,300,293	$	6,707,079	6%
Development	**Avista Development ***	$	28,631	$	-	-
	Total expenditures	**$**	**183,770,237**	**$**	**187,348,892**	**2%**

*Avista development funds are temporary funds designated to develop capacity in 2016 to deliver Energy Trust services to Avista's Oregon customers in 2017. Avista development funds are separate from program delivery funds and are not associated with individual programs.

D. Incentives paid

Quarter	PGE efficiency	Pacific Power efficiency	NW Natural efficiency	Cascade Natural Gas efficiency	Avista efficiency	PGE generation	Pacific Power generation	Total
Q1	$4,288,591	$3,154,390	$1,149,249	$82,957	$0	$2,294,772	$726,292	$11,696,250
Q2	$12,929,962	$7,100,571	$2,726,806	$226,423	$0	$2,638,594	$1,421,608	$27,043,963
Q3	$10,696,488	$7,175,765	$3,067,178	$354,833	$7,955	$1,364,680	$1,940,889	$24,607,788
Q4	$20,731,322	$12,648,377	$5,729,038	$605,603	$28,452	$2,615,196	$3,538,403	$45,896,391
Total	**$48,646,363**	**$30,079,102**	**$12,672,271**	**$1,269,816**	**$36,407**	**$8,913,241**	**$7,627,192**	**$109,244,392**

VI Savings and generation tables[11, 12, 13, 14, 15]

A. Savings and generation by fuel

	Annual savings/generation	Annual goal	Percent Achieved	Levelized Cost
Electric savings	60.0 aMW	55.1 aMW	109%	2.62 ¢ per kWh
Natural gas savings	6,717,522 therms	5,721,145 therms	117%	27.86 ¢ per therm
Electric generation	2.78 aMW	4.13 aMW	67%	6.42 ¢ 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	36.5 aMW	2.63 ¢ per kWh	33.7 aMW	108%	27.2 aMW	134%
Pacific Power	23.6 aMW	2.60 ¢ per kWh	21.4 aMW	110%	16.8 aMW	140%
NW Natural	6.2 million therms	27.47 ¢ per therm	5.3 million therms	117%	3.9 million therms	157%
Cascade Natural Gas	516,885 therms	33.11 ¢ per therm	466,577 therms	111%	447,071 therms*	116%
Avista	34,708 therms	15.26 ¢ per therm	31,574 therms	110%	N/A	N/A

*Cascade Natural Gas Integrated Resource Plan target was submitted as part of the ongoing Integrated Resource Plan process. It was not acknowledged by the OPUC and Energy Trust will work with Cascade Natural Gas on future updates.

[11]Columns may not total due to rounding.
[12]Electric savings also include transmission and distribution savings.
[13]The gas savings do not include results for NW Natural in Washington. These results are available in a separate report on activities for NW Natural in Washington at www.energytrust.org/reports.
[14]Energy Trust reports 100 percent 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.
[15] All gas tables include Avista savings; however, Avista is not reflected in the board-approved goals. Savings goals were approved by the board in December 2015 whereas the addition of Avista for a transition period in 2016 did not occur until February 2016 at the direction of the OPUC.

C. Electric savings by sector and program

		Annual savings aMW	Annual goal aMW	Percent achieved YTD	Levelized cost per kWh
Commercial	Existing Buildings and Multifamily	16.2	15.5	105%	3.12 ¢
	New Buildings	6.8	5.3	128%	2.34 ¢
	NEEA Commercial	1.3	1.0	131%	3.52 ¢
	Commercial total	**24.3**	**21.8**	**111%**	**2.90 ¢**
Industrial	Production Efficiency	11.8	13.4	87%	2.98 ¢
	NEEA Industrial	0.1	0.1	84%	4.22 ¢
	Industrial total	**11.9**	**13.6**	**87%**	**2.99 ¢**
Residential	Existing Homes	4.2	4.0	106%	3.50 ¢
	New Homes and Products	13.9	9.9	140%	2.16 ¢
	NEEA Residential	5.7	5.8	99%	0.92 ¢
	Residential total	**23.8**	**19.7**	**121%**	**2.13 ¢**
	Total electric savings	**60.0**	**55.1**	**109%**	**2.62 ¢**

D. Natural gas savings by sector and program

		Annual savings thm	Annual goal thm	Percent achieved YTD	Levelized cost per therm
Commercial	Existing Buildings and Multifamily	2,139,754	2,001,169	107%	27.38 ¢
	New Buildings	733,692	597,301	123%	23.52 ¢
	Commercial total	**2,873,446**	**2,598,470**	**111%**	**27.17 ¢**
Industrial	Production Efficiency	1,332,695	1,036,453	129%	14.83 ¢
	Industrial total	**1,332,695**	**1,036,453**	**129%**	**14.83 ¢**
Residential	Existing Homes	1,035,884	787,964	131%	39.01 ¢
	New Homes and Products	1,475,497	1,298,258	114%	29.44 ¢
	Residential total	**2,511,381**	**2,086,222**	**120%**	**34.48 ¢**
	Total natural gas savings	**6,717,522**	**5,721,145**	**117%**	**27.86 ¢**

Energy Trust allocated budget to NEEA for gas market transformation activities. While there were no associated savings through 2016, savings are expected in subsequent years.

E. Renewable energy generation by utility

	YTD generation aMW	Annual goal aMW	Percent achieved YTD
Portland General Electric	1.57	1.09	144%
Pacific Power	1.21	3.04	40%
Total	**2.78**	**4.13**	**67%**

F. Renewable energy generation by program

	YTD generation aMW	Annual goal aMW	Percent achieved YTD
Other Renewables program	0.01	0.01	100%
Solar program	2.77	4.12	67%
Total generation	**2.78**	**4.13**	**67%**

- In 2016, the majority of Other Renewables program costs included Energy Trust's support for a pipeline of 48 Other Renewables projects with project development assistance. Project development assistance provides needed support for early-stage development and helps build a pipeline of future renewable energy installation projects that can generate energy in future years.

G. 2016 electric efficiency results for SB 1149 and SB 838 funds

Energy Trust will complete an analysis of the allocation of 2016 savings and related costs to SB 1149 versus SB 838 funding sources, along with the summary of SB 838 expenditures by utility, in fall 2017. An addendum will be issued to the 2016 Annual Report with three SB 1149 and SB 838 tables:

1. 2015 SB 1149 savings and costs (total and by sector)
2. 2015 SB 838 savings and costs (total and by sector)
3. 2015 SB 838 utility expenditures (total and by utility)

As in past years, Energy Trust has engaged a third party to review energy consumption data provided by utilities and determine whether a project should be funded by SB 1149 (all sites using electricity from PGE or Pacific Power are eligible) or SB 838 (limited to sites using less than one aMW annually).

See Appendix 9 for the 2016 electric efficiency results for SB 1149 and SB 838 funds. Information was appended to the report on December 15, 2017.

VII Northwest Energy Efficiency Alliance progress

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.

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 at stores, and through improvements to building codes and equipment standards that will save energy.

NEEA savings noted here are forecasted. Updated savings results will be available in late Q2 2017 through NEEA's Annual Report. Any changes to NEEA savings reported here will be captured in Energy Trust's Annual True Up Report, available Q4 2017.

A. NEEA savings

	Annual savings	Annual energy target	Percent achieved	Levelized cost per kWh
Commercial	1.3 aMW	1.0 aMW	131%	3.52 ¢
Industrial	0.1 aMW	0.1 aMW	84%	4.22 ¢
Residential	5.7 aMW	5.8 aMW	99%	0.92 ¢
Total	**7.2 aMW**	**7.0 aMW**	**103%**	**1.27 ¢**

B. NEEA expenditures

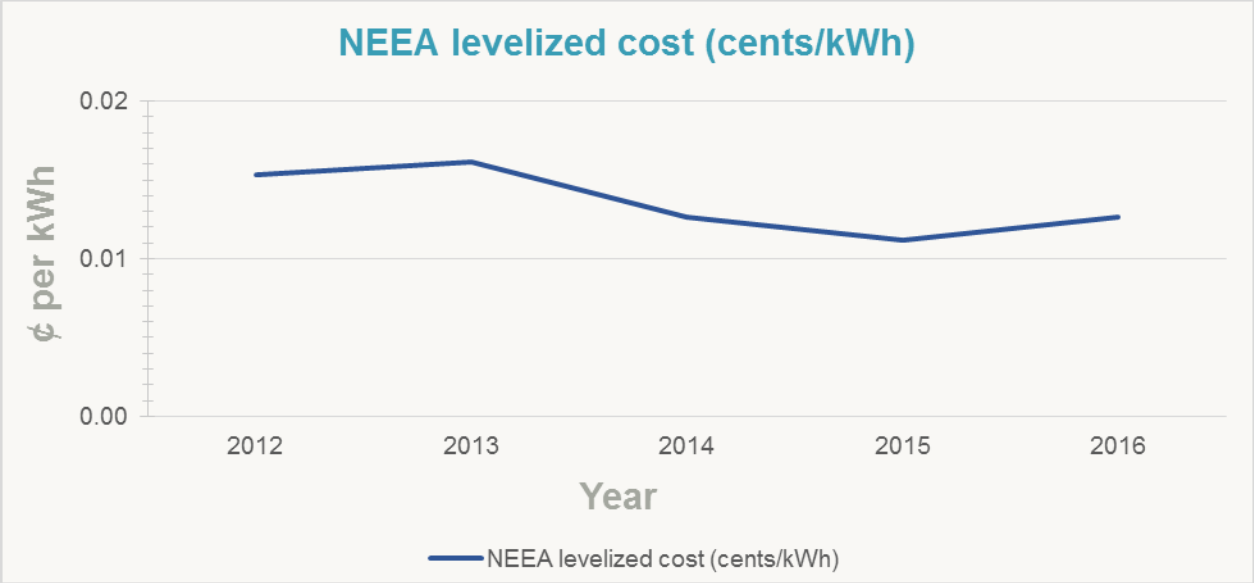
		Annual actual expenditures		Annual budgeted expenditures	Budget variance
Commercial	$	2,688,152	$	2,736,097	2%
Industrial	$	302,371	$	454,918	34%
Residential	$	5,129,572	$	5,019,885	-2%
Total	**$**	**8,120,095**	**$**	**8,210,901**	**1%**

C. Status of NEEA goals in Energy Trust's 2015-2019 Strategic Plan

EMERGING EFFICIENCY RESOURCES	Status
NEEA identification of electric market transformation savings of 35 aMW	On track
Energy Trust identification of electric market transformation savings beyond NEEA's	On track
NEEA gas market transformation progress	In progress

D. NEEA levelized cost

NEEA costs and savings are not realized in the same year. Savings in 2016 reflects costs from prior years, and costs from 2016 will lead to savings in subsequent years. For this reason, levelized costs are included for the past five years.



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

Below are NEEA's long-term goals and strategies, outlined in NEEA's 2015-2019 Business Plan[16].

NEEA facilitates market transformation with the following goals, strategies and performance metrics:

Goal 1: Fill the energy efficiency pipeline with new products, services, practices and approaches.

- Key strategies:
  a. Identify new energy-efficiency opportunities.
  b. Assess the potential for newly identified emerging technologies.
  c. Prove the viability of emerging technology concepts.
- Five-Year Success Metric: Fill the 20-year energy efficiency pipeline with 1,000 aMW of regional potential savings in process and 175 aMW of savings readied for market adoption.

Goal 2: Create market conditions that accelerate and sustain the market adoption of emerging energy-efficiency products, services and practices.

- Key strategies:
  a. Influence market actors to increase availability of energy-efficient products and services.
  b. Improve and ensure product quality.
  c. Build market knowledge and capability.

[16] NEEA's 2015-2019 Business Plan is available online at http://neea.org/docs/default-source/default-document-library/neea-2015-2019-strategic-plan-board-approved.pdf.

d. Identify and develop market resources that capitalize on the compelling value proposition and business case (i.e., "non-energy benefits") for an energy-efficient product, service or practice.
e. Increase product awareness.
f. Develop strategies to address price and first-cost issues.
g. Influence and support the successful implementation of more stringent building codes and appliance standards.

- Five-Year Success Metric: In all of the markets in which NEEA works, including Oregon, NEEA programs are to result in substantive and measurable change in market conditions, resulting in energy savings.

More information and NEEA's market transformation strategies, processes and performance metrics is available in NEEA's 2015-2019 Business Plan and recent annual or quarterly reports[17].

F. NEEA gas market transformation progress indicators

Progress indicator	Status
2015: Complete scanning research and concept opportunity assessment for two technologies	Achieved
2016: Complete concept opportunity assessment for three technologies	Achieved
2017: Complete market and product assessment for one technology; five additional technologies in "Scanning"	N/A
2018: Complete strategy testing and finalization for one technology	N/A
2019: At least two technologies ready for scale-up	N/A

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

Energy Trust provides regular guidance to NEEA through membership on the board of directors and all seven of NEEA's advisory committees.

Committee	Energy Trust staff member
Regional Portfolio Advisory Committee	Fred Gordon, director of planning and evaluation
Cost-effectiveness Advisory Committee	Adam Shick, senior planning project manager
Emerging Technology Advisory Committee	Mike Bailey, engineering manager
Natural Gas Advisory Committee	Mike Bailey, engineering manager
Northwest Research Advisory Committee	Phil Degens, evaluation manager
Residential Sector Advisory Committee	Mark Wyman, program manager
Commercial Sector Advisory Committee	Oliver Kesting, commercial sector lead
Industrial Sector Advisory Committee	Sam Walker, senior program manager
Board of Directors	Margie Harris, executive director[18]

Energy Trust staff provided the following direction to NEEA through committees:

- As secretary of the NEEA Board, Energy Trust's executive director provided strategic, policy-level guidance on NEEA's activities in 2016, including NEEA's market transformation programs and regional strategic market planning efforts. Energy Trust also provided guidance on a proposed regional end-use

[17] NEEA's recent annual and quarterly reports are available online at http://neea.org/resource-center/neea-performance-reports.
[18] Michael Colgrove, executive director, will replace Margie Harris on the NEEA board of directors on January 1, 2017.

load research study, and prospective market transformation activities related to demand response and electric vehicles.

- As chair of the NEEA's Board Strategic Planning Committee, Energy Trust's executive director guided the launch of the planning process for NEEA's 2020-2024 renewal period and stakeholder outreach plan.
- Energy Trust staff provided guidance through the Regional Portfolio Advisory Committee supporting adoption of the Regional Strategic Market Plan for Consumer Products, including adding commercial window attachments, new manufactured homes and commercial code enhancement to NEEA's Market Transformation portfolio in 2016.
- Energy Trust staff provided feedback to the NEEA Industrial, Commercial and Residential Advisory Committees on NEEA initiatives, and facilitated cross-organizational collaboration on topics including Strategic Energy Management infrastructure, Commercial Code enhancement, Commercial Real Estate tools and training, new measures based on extended motor products and emerging technology such as next generation compressed air nozzles. Energy Trust staff continued to provide leadership in the NEEA-convened Northwest SEM Collaborative, a peer-to-peer network for program administrators, implementers and evaluators that speeds innovation and advances SEM program progress in the region. Energy Trust staff engaged in 2016 on numerous NEEA program work groups to provide tactical guidance on program implementation efforts to ensure program effectiveness while preventing overlap and confusion in the market. Activities at the work-group level are shared as appropriate with the sector advisory committees, regional portfolio committee, and in some cases, the NEEA board.
- Through membership on NEEA's Gas Advisory Committee, Energy Trust helped prioritize and explore several emerging gas efficiency technologies.
- Energy Trust staff helped redesign NEEA's process for the Emerging Technology Advisory Committee to improve regional coordination on new technology pilots.
- Energy Trust staff participated in the steering group for a new NEEA-staffed regional initiative to coordinate commercial and industrial lighting initiatives to improve mid-term results and develop new efficiency opportunities. Energy Trust also participated in a similar initiative regarding retail product efficiency.
- Energy Trust staff helped NEEA update the ENERGY STAR Retail Products Portfolio selection process, facilitating improved coordination between NEEA and workgroup members.

H. Energy Trust opts out of select NEEA efforts

Energy Trust opts out of industrial technical training, one of NEEA's infrastructure offerings for member utilities. It was found to be duplicative with other training resources that Energy Trust sponsors for industrial and agricultural businesses and had lower participation. Energy Trust provides extensive training in comprehensive SEM through the Production Efficiency program, sponsors the annual Northwest Industrial Efficiency Summit, and sponsors more than 20 system-focused industrial technical training classes per year, which are provided to PGE and Pacific Power customers by PGE's customer technical training group. Opting out of NEEA's industrial technical training means that Energy Trust does not fund that effort and does not work with NEEA to plan and coordinate these efforts in Energy Trust territory.

APPENDIX 1: Customer satisfaction results

Energy Trust calculated customer satisfaction from short telephone surveys conducted with randomly selected participants soon after they completed projects. The survey asked participants about overall satisfaction with Energy Trust. Participants in the Existing Buildings (including Existing Multifamily), Production Efficiency and commercial Solar programs were also asked about satisfaction with program representatives. Surveys were conducted with 2,020 residential customers and 578 non-residential customers in Oregon who received an Energy Trust incentive in 2016. In 2016, the average rate of overall satisfaction with Energy Trust was 93 percent, and the rate of satisfaction with interactions with Energy Trust program representatives was 96 percent.

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. In early 2017, 38 New Buildings project owners or representatives were surveyed about their overall 2016 program satisfaction and satisfaction with communications with program representatives. Of participants surveyed, 89 percent were satisfied with their overall program experience. Satisfaction with program representatives was 94 percent. These results inform Energy Trust's overall 2016 satisfaction ratings.

Table 1: 2016 overall satisfaction

	2016 overall satisfaction
Existing Buildings, including Multifamily	93%
New Homes and Products[19]	96%
Existing Homes	92%
New Buildings	89%
Production Efficiency	97%
Solar[20]	91%
Unweighted average	**93%**

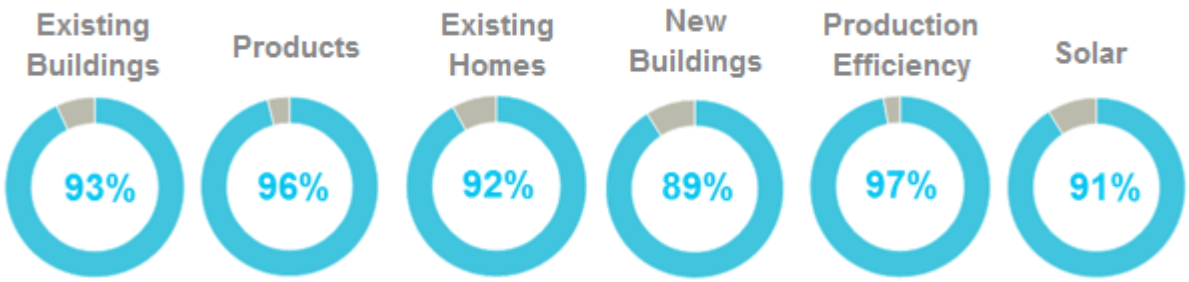
Table 2: 2016 satisfaction with program representatives

	2016 satisfaction with program representatives
Existing Buildings, including Multifamily	94%
New Buildings	94%
Production Efficiency	98%
Commercial Solar	96%
Unweighted average	**96%**

Note: 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—some may call the call center and others may not interact with a program representative. In general, commercial and industrial participants have more interaction with Energy Trust representatives.

[19] Only Products customers were surveyed. Energy Trust does not track purchasers of new homes.
[20] Includes both residential and commercial solar photovoltaic participants.

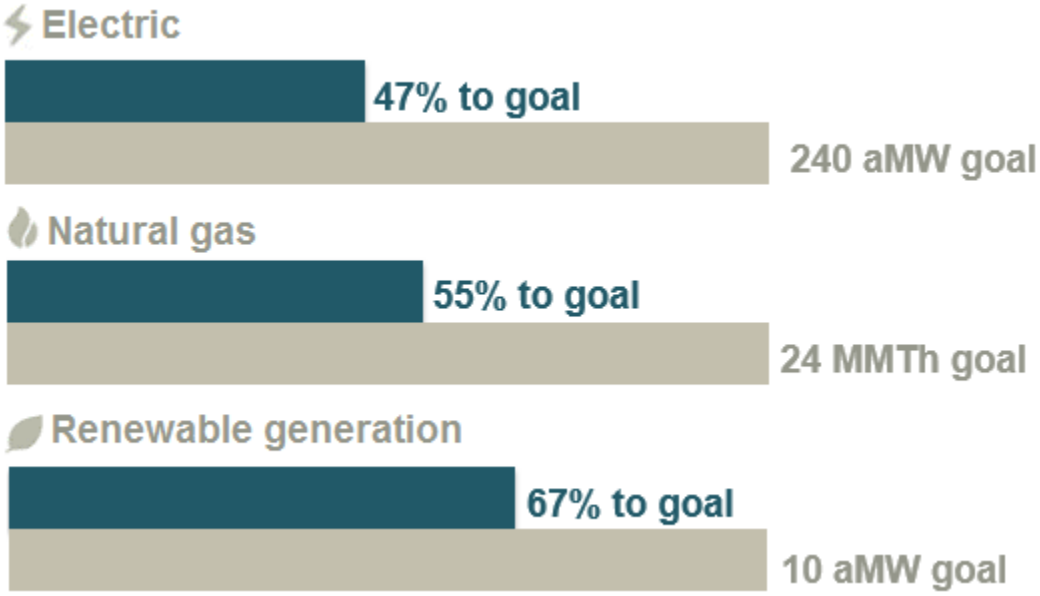
Percent of customers satisfied overall for 2016



APPENDIX 2: Progress to 2015-2019 Strategic Plan goals; cumulative and total annual results

Progress to 2015-2019 Strategic Plan goals

- **Energy Trust achieved 47 percent of the Strategic Plan electric-savings goal of 240 aMW** through 2016.
- **Energy Trust achieved 55 percent of the Strategic Plan gas-savings goal of 24 million annual therms** through 2016.
- **Energy Trust achieved 67 percent of the Strategic Plan renewable generation goal of 10 aMW** through 2016.



Cumulative and total annual results

- **Total annual savings of 607 aMW** have been realized since electric efficiency programs began in 2002, equivalent to powering approximately 470,000 Oregon homes. This total includes 22 aMW of savings from self-direct customers.
- **Total annual savings of 51.9 million annual therms** have been realized since gas efficiency programs began in 2003, equivalent to providing gas heat to approximately 102,000 Oregon homes.
- **Total annual renewable energy generation of 121.4 aMW** has been installed since 2002, equivalent to powering approximately 94,000 Oregon homes.
- **The net economic benefits of Energy Trust 2002-2015 expenditures**, energy savings and renewable energy generation added $4.8 billion to the local economy, including $1.5 billion in wages, $266 million in small business income and employment equivalent to 3,900 full-time jobs lasting a decade. With the inclusion of 2016 results, these benefits are expected to increase.[21]
- **Through 2015, air quality improvements stemming from Energy Trust investments have kept more than 17.4 million tons of carbon dioxide out of the atmosphere**, the equivalent of removing more than 3

[21] The net economic benefit of Energy Trust expenditures, savings and generation is from an independent analysis by third-party Pinnacle Economics completed in spring 2016.

million cars from Oregon roads for one year. With the inclusion of 2016 results, these air quality improvements are expected to increase.

- **Since 2003, Energy Trust has invested more than $9.5 million in energy-efficiency projects at nearly 1,000 public K-12 Oregon schools**, and provided more than $3 million in funding for solar electric and wind energy systems at nearly 60 public schools.
- **Energy Trust investments in energy efficiency and solar generation will save utility customers nearly $5.6 billion** on their utility bills over the lifetime of those investments. Participating customers have already saved nearly $2.3 billion on their energy bills since 2002. With the inclusion of 2016 results, these savings are expected to increase.

APPENDIX 3: Renewable resource development targets

A. Purpose of project development assistance

Energy Trust provides project development assistance and installation incentives for projects that will generate renewable energy from hydropower, biopower, wind and geothermal resources.

The primary goal of project development assistance is to expand distributed renewable energy generation in Oregon by minimizing early stage development barriers. By providing project development assistance, Energy Trust builds a pipeline of projects that are able to apply for installation incentives, expands awareness of the market for various renewable energy technologies, and meets a need for early-stage project support that will help secure longer-term financing.

To access project development assistance, project applications are required prior to beginning the proposed development activity. Energy Trust's project development assistance incentive funds, typically up to 50 percent of the cost of the activity, are provided as a reimbursement following completion of the activity and full payment of all contractors or subcontractors. In this way, the project proponent has significant vested interest to ensure the development activity is a necessary and fiscally sound step in moving a proposed project forward.

While project proponents using eligible technologies can apply for project development assistance incentives, staff are focused on outreach to projects in two key areas:

1) Electricity generation through the combustion of biogas created by the anaerobic digestion of organic wastes at water resource recovery facilities (also known as wastewater treatment plants) and food processors.
2) Hydroelectric projects made possible through the modernization of irrigation water delivery infrastructure by irrigation districts and other agricultural water providers, and

B. Barriers to project development

Energy Trust's project development assistance is designed to address the main barriers to renewable energy project development. Those barriers in 2016 remained similar to those in 2014 and 2015. Helping projects overcome these barriers builds a pipeline of projects that can apply for incentives, complete construction and generate renewable energy.

- **It is difficult to find capital to support early stage work.** The most risky time to invest money in a renewable energy project is at the beginning. Investors are reluctant to put funds into a project with unclear potential. Without early stage funding, a project cannot advance to the point where the risk is reduced. By providing early stage funds, Energy Trust builds a pipeline and helps move projects forward, enabling them to attract additional financing and eventually construct a project. In addition, Energy Trust's support demonstrates confidence that can help projects successfully secure other sources of funds. In some cases, projects at this early stage learn they are not feasible. Energy Trust helps project owners reach that point with limited exposure.

- **Less sophisticated developers whose primary business is not energy encounter difficulties navigating the stages of developing a project.** Energy Trust works with many project developers that are not professional developers. Moving through the steps of resource characterization, feasibility, permitting and interconnection can be lengthy and difficult. Project development assistance—both financial and technical—helps developers navigate these steps in less time and for less cost, and learn industry best practices and how to avoid mistakes.

- **Market conditions for distributed renewable generation in Oregon continue to be challenging.** At all stages of the development process, project owners face poor market fundamentals, including low avoided cost rates and diminished state and federal incentives. Project development assistance is a tool to continue to attract investment in projects in Oregon and to maintain development capacity in the state.

C. Project development assistance activity in 2016

This report details the specific uses of project development assistance in these areas in 2016.

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 in future years. As a result, the pipeline of active non-solar renewable energy projects is the largest in Energy Trust's history, nearly triple the 18 participating projects in 2014 and significantly more than the 35 participating in 2015.

Summary of project development assistance activity in 2016

	Projects supported	Total funds committed	Total funds spent
Focus Area 1: Biogas	6	$80,930	$89,860
Focus Area 2: Irrigation hydropower	26	$2,250,043	$1,341,206
Outside of focus areas	16	$654,108	$375,953
Total	**48**	**$2,985,081**	**$1,807,019**

The growth is largely due to the success of outreach efforts for hydropower projects. With high demand for project development assistance funds, staff fully allocated the 2016 budget for development assistance and expect the 2017 budget to be fully allocated as well. If staff determine that demand is likely to exceed available budget, Energy Trust will use competitive processes to allocate project development assistance funds.

D. Focus area: Electricity generation from the combustion of biogas

Biogas projects supported: 6

Milestones met

- Biogas feasibility study
- Permitting assistance
- Co-digestible organic feedstock assessments
- Accounting services to secure the federal Investment Tax Credit
- Biogas flow meter replacements
- Cogeneration pre-design

Oregon's businesses and municipalities manage and process significant volumes of organic material, which increases as Oregon's population grows. These organic materials, primarily waste products from food processing as well as municipal wastewater solids at water resource recovery facilities, are often putrescent, expensive to move and pose human health risks. Traditional methods of safely managing these materials include land application and landfilling.

With recent advancements in technology, these materials can serve as valuable feedstocks in the production of biogas. Under the correct conditions, organic material can produce biomethane, or biogas, through a process known as anaerobic digestion. This biogas, about 60 percent methane, may be used as a renewable fuel to serve the facilities' onsite heat and power needs.

Oregon's water resource recovery facilities treat wastewater to standards that protect human health and the environment. Treating wastewater is an energy intensive process. The amount of energy necessary to treat the water is often overlooked, and costs are passed on to water ratepayers.

Energy Trust and the Oregon Association of Clean Water Agencies recognize that water resource recovery facilities are ideal locations for investments in energy efficiency and renewable energy generation (primarily biopower and solar). These facilities are permanent, publically owned with a growing base of ratepayers, provide an essential public service, have access to low-cost capital, are in close proximity of electricity transmission, and usually have significant onsite heat and electricity demands. Municipalities can greatly benefit from guidance and financial incentives to help them investigate whether biopower is a sound capital investment option. Energy Trust deploys project development assistance to assist municipalities to investigate this option, help them move through the steps necessary to planning a project, and learn about the opportunities for adding or expanding generation.

Project development assistance incentives can help offset the cost of feasibility studies, regional organic material feedstock studies, and pre-design and design studies. Additionally, Energy Trust uses operations and maintenance, production and market information gleaned from existing biopower projects to inform potential future biogas projects.

Food processors are also recognizing significant potential for combined heat and power from biogas. Oregon has a significant number of food processors and a burgeoning craft brewing and distilling sector. Traditionally, these businesses have either disposed of all waste in the sewer collection system or separated wastewater solids and land-applied them or delivered them for use as livestock feed. Firms located in urban and suburban areas face significant sewer charges for disposing of waste. These high fees motivate interest in onsite treatment options including biopower. In the last year, Energy Trust used project development assistance to support biopower feasibility studies at two of the largest breweries in Oregon.

E. Focus area: Irrigation hydropower

Energy Trust supports several types of irrigation hydropower projects, which are categorized by customer type and process used. Staff see strong hydropower opportunities at 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 offering provides a comprehensive and systematic way for irrigation districts and other agricultural water suppliers to assess hydropower potential and identify additional water delivery system improvements and benefits.

1. Irrigation modernization hydropower

Irrigation modernization projects supported: 14

Milestones met

- Compilation and evaluation of information on existing water use and infrastructure
- Evaluation of stakeholder needs
- Evaluation of water and energy conservation potential
- Evaluation of environmental benefits and water quality impacts
- Evaluation of hydroelectric potential
- Evaluation of economic impacts
- Development of system optimization plans

Like other western states, most of Oregon's agricultural water is delivered to farms by irrigation districts or other water providers using aging, open canal systems. Many of these conveyances were dug more than 100 years ago and lose significant quantities of water to seepage and evaporation. Modernizing irrigation infrastructure enables energy and water benefits, and creates additional opportunities for agricultural security, rural prosperity, drought resiliency and environmental improvements.

Hydropower electric projects using irrigation water have been a programmatic 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 they can provide.

Modernizing an irrigation district is complex. The process typically starts by replacing open canals with pipes, which saves water by eliminating seepage and evaporation. Irrigation canals use gravity to keep water flowing. Once piped, the water is naturally pressurized, allowing irrigators to remove pumps, reducing energy use and maintenance costs. Pressurized water may also enable additional upgrades to more water-efficient on-farm irrigation systems. Excess water pressure can be used to generate hydropower, with revenues from the sale of renewable electricity helping to finance project implementation.

The irrigation modernization offering 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 offering 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. In addition to building awareness that modern agricultural water management can help mitigate the impacts of long-term drought on agricultural production and regional watersheds and ecosystems, the irrigation modernization offering is a replicable and scalable model to achieve large-scale implementation and benefits in Oregon and in other states.

In 2016, irrigation modernization assessments were underway at 14 Oregon irrigation districts. Expected to be completed in 2017, these assessments will identify the renewable energy, energy efficiency, agricultural, water, environmental and economic benefits associated with modernization and characterize various potential project implementation approaches. Each irrigation district will choose the implementation approach that is right for their situation. After a district's board selects a preferred approach, design, permitting and financing will begin, followed by contracting and construction.

Early results show potential. In one irrigation district, more than 20 megawatts of hydropower potential has been identified along with significant water savings and other benefits. However, not every irrigation district is expected to present such strong hydropower opportunities.

In 2016, the offering was recognized with a State Leadership in Clean Energy award from the Clean Energy States Alliance. The offering has enjoyed strong support from irrigation districts, state and federal natural resource agencies, and non-governmental organizations.

An additional 12 irrigation districts have expressed interest in starting the modernization assessment process in 2017. The 2017 assessments are expected to be accomplished faster and at lower cost than those in 2015 and 2016 as the offering matures and operational efficiencies are implemented.

In 2015 and 2016, the irrigation modernization offering was delivered by Farmers Conservation Alliance, a nonprofit that develops resource solutions for rural communities. Farmers Conservation Alliance has worked with individual farmers, irrigation districts, agencies, tribes, nonprofits and foundations to form collaborative relationships that support modern irrigation systems. Farmers Conservation Alliance will continue to deliver the offering in 2017.

2. Other agricultural hydro projects (non-irrigation modernization)

Energy Trust continues to support irrigation hydropower development outside of the irrigation modernization offering. The difference between these projects and those enrolled in the irrigation modernization offering is that the other potential modernization benefits are not being explored in the projects below. Twelve other irrigation hydropower projects moved forward with project development assistance in 2016, the majority within water provider canals but also including two on-farm hydropower opportunities using irrigation water.

Irrigation district hydro projects supported: 7

Milestones met:

- Field surveys
- Geotechnical analysis
- Preliminary engineering
- Financial viability modelling

Other agricultural water provider projects supported (non-irrigation district): 3

Milestones met:

- Resource assessments
- Siting, preliminary engineering and design

- Flow data collection
- Ownership structure coordination and energy use analysis
- Financial analysis
- Initial permitting and interconnection
- Financing

On-farm hydropower projects supported: 2

Milestones met

- Resource assessments
- Siting
- Preliminary engineering and design
- Energy use analysis
- Financial analysis
- Initial permitting and interconnection
- Financing

F. Project development assistance outside of focus areas

Energy Trust supported 16 projects outside of focus areas in 2016: 10 hydropower, three geothermal, one biomass, one biogas and one community wind. These projects represent a wide variety of distributed renewable energy generation opportunities. While all are viable, staff do not focus on these particular opportunities because past research has indicated that the market for these types of projects is smaller than for irrigation hydropower and biogas projects, permitting is challenging and upfront development costs can be high. Energy Trust remains open to these opportunities and provides staff support, but does not engage in a targeted outreach effort to these types of projects.

1. Other hydropower projects

Other hydropower projects supported: 10

Projects include an upgrade at an existing hydropower facility, three municipal projects at pressure reduction valve sites, five projects exploring hydropower at non-powered dams and one run-of-river project on a natural stream.

Milestones met:

- Resource assessments
- Siting
- Preliminary engineering and design
- Energy use analysis
- Financial analysis
- Initial permitting and interconnection
- Financing

2. Geothermal projects

Geothermal projects supported: 3

Milestones met:

- Geophysical data compilation
- LIDAR imaging and fault analysis
- Aeromagnetic surveying
- Gravity surveying
- Magnetotelluric surveying
- Temperature gradient well drilling

3. Woody biomass projects

Woody biomass projects supported: 1

Milestones met:

- Preliminary design and engineering
- Feasibility assessment of integration with existing cogeneration facilities

4. Manure biogas projects

Manure biogas projects feature combined heat and power using the anaerobic digestion of livestock (feedlot) waste.

Manure biogas supported: 1

Milestones met:

- Transmission study

5. Community wind projects

Community wind projects supported: 1

Milestones met:

- Installation of meteorological tower
- Wind resource data collection and analysis
- Feasibility analysis

APPENDIX 4: 2016 gross savings

This appendix provides Energy Trust's 2016 energy savings in gross savings. Gross savings are energy savings that result from Energy Trust programs, regardless of why customers participated.

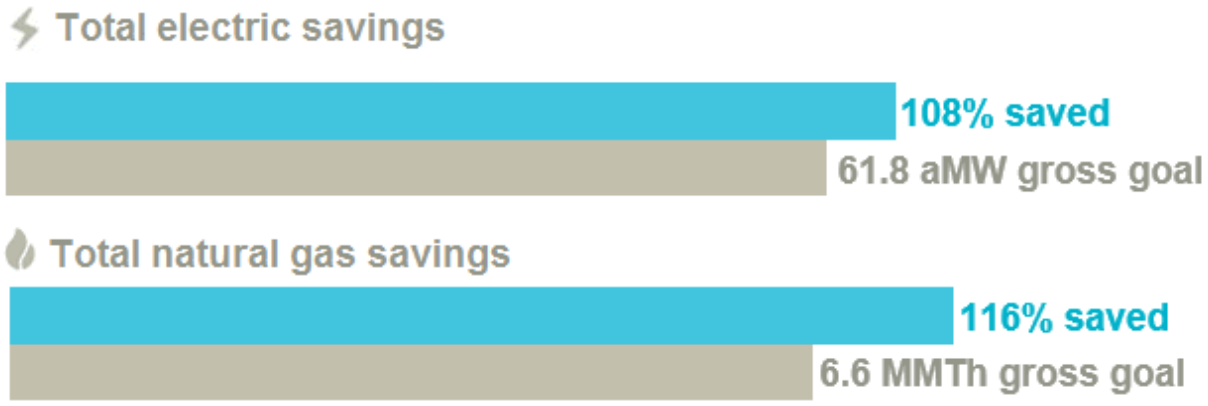
In the body of Energy Trust's annual and quarterly reports to the OPUC, Energy Trust reports results in net savings. Net savings refer to the portion of gross savings that is directly attributable to Energy Trust programs. Net savings do not include savings from participants who would have completed an energy-saving action even in the absence of the program (free riders), and do include estimates of savings from participants who completed an energy-saving action because of awareness of the program but didn't receive a program incentive (participant spillover effect).

Energy Trust's gross energy generation is equal to net renewable energy generation. Because of Energy Trust's mandate to support only renewable projects with above-market costs, these projects are unlikely to move forward without Energy Trust incentives and therefore are not free riders. Based on these factors, Energy Trust claims 100 percent of generation for all renewable energy projects that receive incentives.

Progress toward gross annual efficiency and generation goals

	Annual savings/ generation (gross)	Annual goal (gross)	Percent Achieved
Electric savings	66.6 aMW	61.8 aMW	108%
Natural gas savings	7.6 million therms	6.6 million therms	116%
Electric generation	2.8 aMW	4.1 aMW	67%

Gross savings



APPENDIX 5: 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 2016 are included in the body of this annual report as a portion of NW Natural savings and reported separately below.

		Annual savings	Annual actual expenditures	Levelized cost/therm
Commercial	Existing Buildings	888,018	$1,981,133	18.9 ¢
	New Buildings	14,951	$65,627	25.6 ¢
	Commercial total	**902,970**	**$2,046,760**	**19.0 ¢**
Industrial	Production Efficiency	1,147,255	$1,484,896	11.4 ¢
	Industrial total	**1,147,255**	**$1,484,896**	**11.4 ¢**
	Total	**2,050,224**	**$3,531,656**	**14.9 ¢**

APPENDIX 6: Background, mission and goals

A. Background

Our mission is to help customers and utilities meet their energy needs with the cheapest and cleanest energy available. Since March 2002, we have been entrusted to invest public purpose funds from utility customers and deliver benefits from energy-efficiency improvements and renewable energy generation. We serve customers in coordination with utilities, community and industry organizations, government agencies and two other electric public purpose fund administrators—Oregon Housing and Community Services and the Oregon Department of Energy. This work benefits our state by building a more sustainable and brighter energy future, and contributing to our local and state economy in positive ways.

Energy Trust is an independent 501(c)(3) nonprofit organization funded by and serving Oregon customers of Portland General Electric, Pacific Power, NW Natural, Cascade Natural Gas and Avista, and NW Natural customers in Washington. We offer energy efficiency and renewable energy programs and services to every type of customer, including those who own, rent or lease their home or building, product manufacturers, small and large businesses and industries, nonprofit and public organizations, farmers and ranchers. New offers and effective collaboration enable us to provide clean energy solutions for a growing number of consumers, businesses, communities and schools. 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. Through these actions, participating customers derive a range of benefits—lower energy bills, greater comfort, better indoor air quality, improved productivity and lower carbon emissions.

As a steward of utility customer dollars, we consistently maintain low administrative and program support costs, and ensure the majority of public purpose funds flow back to customers as incentives, services and education. We competitively bid our program management and delivery contracts, assuring the best prices for the services provided. For most programs, Energy Trust leverages specialized local trade and program ally businesses—many of whom employ 20 or fewer staff—already serving customers in the marketplace. We support and leverage this network of trade ally contractors, allied professionals and participating retailers throughout the state that are familiar with Energy Trust incentives and connect customers directly to them. This approach keeps Energy Trust costs low, supports our region’s energy services sector and sustains opportunities in the areas we serve.

We are led by an independent, diverse board of directors whose members volunteer their time and expertise, and our work is shaped by advice from two advisory councils comprised of stakeholders. We strive to be inclusive and transparent by holding open meetings and publishing meeting agendas, notes, independent third-party evaluations of programs, draft and final budgets and action plans, reports and audited financial statements on our website.

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 and Cascade Natural Gas and built from each utility’s Integrated Resource Plan. This collaboration enables Energy Trust to focus on and be accountable for delivering the lowest-cost energy available to meet the needs of every utility customer. In addition, annual renewable energy generation goals are developed using knowledge of the market obtained through renewable resource assessments.

B. Purpose statement

Energy Trust provides comprehensive, sustainable energy efficiency and renewable energy solutions to those we serve.

C. Vision statement

Energy Trust envisions a high quality of life, a vibrant economy and a healthy environment and climate for generations to come, built with renewable energy, efficient energy use and conservation.

D. 2015-2019 Strategic Plan goals and strategies

- Save 240 aMW of electricity
- Save 24 million annual therms of natural gas
- Install 10 aMW of renewable energy
- Expand participation
- Make energy efficiency more affordable
- Identify new technologies with energy-saving potential
- Continuously improve programs and services
- Provide project development support and incentives for renewable energy projects
- Work more efficiently
- Remain flexible and open to new opportunities

APPENDIX 7: 2016 Energy Trust board of directors; board development guidelines; 2016 advisory council members and meetings

PRESIDENT—Debbie Kitchin, Portland, is the co-owner of InterWorks LLC, a construction company engaged in commercial tenant improvement and renovation and residential remodeling services. InterWorks is an award-winning contractor specializing in sustainable building practices. Prior to joining the family business in 1996, she served as senior economist for the Northwest Power and Conservation Council for 15 years and was a regional economist for the Bonneville Power Administration for three years. Debbie is treasurer of the Portland Business Alliance, vice president of the Central Eastside Industrial Council and a board member of the Portland Building Owners and Managers Association. She is a past president of the Portland Commercial Real Estate Women. *Debbie has served as president since February 2014.*

VICE PRESIDENT—Ken Canon, Myrtle Creek, founded in 1981 the Industrial Customers of Northwest Utilities, a regional trade association focused on electric energy issues. Since retiring from that role in 2005, he chaired a committee that examined the performance of NEEA and also managed the Northwest Energy Efficiency Task Force. Earlier in his career, while working for Associated Oregon Industries, he drafted and helped enact Oregon's Business Energy Tax Credit. Later, he helped implement a comprehensive energy-efficiency program at an international paper mill. He has a long history of organizing, managing and advising nonprofit organizations. Applying his expertise to his residence, Ken built the first ENERGY STAR home in Douglas County. Ken, a life-long Oregonian, was born and raised in Medford and graduated from Southern Oregon University and Willamette University College of Law. *Ken has served as vice president since February 2014.*

SECRETARY—Alan Meyer, Salem, 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. He has also served for more than 20 years on the City of Salem Morningside Neighborhood Association board. *Alan has served as secretary since February 2013.*

TREASURER—Dan Enloe, Portland, retired supply chain manager at Intel Corporation in Hillsboro, where he worked in varying capacities since 1984. Prior to 1984, he was on active duty in the U.S. Navy and served as a nuclear submarine officer. Since leaving active duty, he served with the Naval Reserve, completed six reserve command tours and retired as a captain in 2009. He is a member of the Naval Reserve Association, the American Legion and the Navy League. A graduate of the U.S. Naval Academy with a degree in electrical engineering, he holds two patents. *Dan has served as treasurer since November 2012.*

Susan Brodahl, Portland, is a vice president in the Portland office of Heffernan Insurance Brokers as well as an owner of Heffernan Group. Heffernan Group 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. Her philosophy is "clients for life." Susan is a frequent featured speaker at regional and national

conventions as well as published in various trade and mainstream journals. She has been awarded the Lifetime Achievement Award from the Painting and Decorating Contractors of America, and has an economics degree from Willamette University.

Melissa Cribbins, Coos Bay, is a Coos County commissioner and an attorney. Prior to her election in 2012, she worked for the Coquille Indian Tribe as in-house counsel for six years. Before Melissa became an attorney, she 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 and the Washington State Bar, and is active in many organizations both in Coos County and statewide. Melissa is a graduate of Portland State University and Gonzaga University.

Heather Beusse Eberhardt, Portland, is a six-year veteran in the renewable energy field. As project director of development at NextEra Energy Resources, she is responsible for developing distributed generation projects. Prior to NextEra, she held several positions at EDF Renewable Energy in Portland, most recently as director of solar technology evaluation and implementation. Previously, Heather acted as director of partnership development at GLOBIO and worked at Intel in corporate finance where she led the Intel Employee Sustainability Network. Heather currently serves on the board of Burke E. Porter Machinery and volunteers as a member of Social Venture Partners. Her efforts outside of renewable energy included working as a middle school math instructor for Teach For America. Heather graduated from Colby College with a degree in economics and has a Masters of International Management from Thunderbird School of Global Management.

Roger Hamilton, Eugene, recently retired as a consultant with Western Grid Group, an organization that promotes transmission access for renewable energy projects across the West. He also consults with The Resource Innovation Group on climate change adaptation and mitigation. He owns and operates a cattle and hay ranch in Southern Oregon. He has spent many years in public service as a Klamath County commissioner, an advisor on energy and watersheds to Governor John Kitzhaber and an Oregon Public Utility Commissioner. He has also served on the Oregon State Parks Commission and the National Association of Public Utility Commissioners. He currently serves on the board of directors of the Regulatory Assistance Project.

Lindsey Hardy, Bend, is the project director of the Bend Energy Challenge, a program of The Environmental Center. The Bend Energy Challenge is competing for the Georgetown University Energy Prize, a national, two-year competition to reduce energy use. Most recently Lindsey 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. Previously 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. Lindsey graduated from Ithaca College with a Bachelor of Arts in Environmental Studies.

Mark Kendall, Salem, has more than 34 years of 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 2001-2006. 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 his bachelor's degree from Linfield College with an emphasis in communications and energy management, and his master's degree in organizational development from the Leadership Institute of Seattle City University.

John Reynolds, Eugene, is a professor of architecture emeritus at the University of Oregon and a fellow of the American Institute of Architects. He has been involved in energy issues in Oregon since 1972, when he was elected to the Eugene Water and Electric Board. Since then, he has served as chair of the American Solar Energy Society, president of Solar Energy Association of Oregon and member of the board of the International Solar Energy Society. He has served on the Oregon Alternate Energy Commission and the Energy Committee of the Building Codes Structures Board.

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 called Enoteca is located in Ashland. An award-winning entrepreneur, she developed the concept and helped found the 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.

Eddie Patrick Sherman, Portland, is a principal with Against the Current Consulting Group and works with clients interested in improving the quality of life in Native American communities. Eddie is a member of the Navajo and Omaha Nations and grew up on the Navajo Nation Reservation. In Navajo tradition, it is customary to identify someone's clan upon introduction: *Ya'at'eeh, Shi ei Eddie Sherman. Nat'oh Dine'e Tachii'nii nishlii doo [Tapa] Omaha Deer Clan ei bashishchiin. Bit'ahnii'nii ei dashicheii, nana [Tapa] Omaha Deer Clan ei dashinali. Todineeshzhee'dee ei naasha.* This translates to: Hello, my name is Eddie Sherman. I am Tobacco People, born for the [Tapa] Omaha Deer Clan. My maternal Grandfather's clan is Folded Arms people and my paternal Grandfather's clan is [Tapa] Omaha Deer Clan. I am from Kayenta, Arizona.

Prior to Against the Current Consulting Group, he was the communications and development manager for ONABEN, a nonprofit founded by four Oregon tribes to encourage private sector development on reservations. He currently serves on the board of the Native American Youth and Family Center, NAYA, co-chairs the Steering Committee for JustPortland and served on the Portland Human Rights Commission. Eddie received his bachelor's degree in International Political Economy from Colorado College.

ex-officio

Steve Bloom, Salem, is one of three Oregon Public Utility Commissioners. He was a water rights lawyer in Pendleton and part-time U.S. magistrate judge. In 2005, he joined the Peace Corps and went to Armenia. He worked on amending that country's constitution; a national election was held and it was amended. He was then asked to head a judicial reform program. Upon returning to Oregon, he was counsel to an international wind energy company for four years. He was appointed to the OPUC in 2011. He was recently re-appointed for another four-year term. He attended Dartmouth and Stanford and has a B.A. in English. He also has a J.D. from Willamette College of Law.

Oregon Department of Energy Special Board Advisor

Warren Cook, Salem, is the manager of Energy Efficiency and Conservation at the Oregon Department of Energy. In this role, Warren develops and implements programs and services for the public sector, schools, and industrial and agricultural facilities. With more than 30 years of experience in energy efficiency, Warren has worked in residential and commercial program design and development, and provided technical training to trade allies and technical schools. Warren started his career as a weatherization contractor in eastern Washington

during the initial launch of energy-efficiency programs in the region. As a U.S. Department of Energy trained Residential Conservation Service auditor and trainer, he performed more than 2,000 residential audits and developed early software for energy retrofit assessments. Warren supported the development of the Northwest Energy Code and Washington State Energy Code. He is a corresponding member of the Northwest Power and Conservation Council's Regional Technical Forum, an Associate at the American Society of Heating, Refrigerating and Air-Conditioning Engineers, and holds certification in Information Technology from Willamette University. *Warren began serving on the board in May 2015.*

Board Development Guidelines

Energy Trust's board of directors is a non-stakeholder, volunteer board. The board 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 that 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 mission.

The initial board of directors included nine members from a variety of energy and business backgrounds, and one non-voting ex-officio member from the OPUC. As board openings arise, the board consults advisory councils, individuals and collaborating organizations to identify candidates with appropriate experience from throughout the state. To allow further diversity, the board expanded its size to 13 voting members.

The 2016 board included voting members with background in business (agriculture, industry/ manufacturing, construction/remodeling, restaurant), private consulting, nonprofit and higher education. Members come from Bend, Coos Bay, Eugene, Medford, Myrtle Creek, Salem and the Portland area. Of the 13 voting members at the end of the year, six were women. The board's OPUC ex-officio member is Commissioner Steve Bloom. The board created an additional non-voting position for an appointee of the Oregon Department of Energy. Warren Cook, Oregon Department of Energy energy conservation manager, has been special advisor since May 2015.

All new members participate in an orientation session and are provided handbooks containing historical information, policies, plans, budgets and program descriptions. The majority of board members also attend advisory councils and participate on board committees. All regular board and advisory council meetings and background information are public. Advisory council and board meetings are well attended, and public comment is included in every meeting.

All regular board members complete and sign disclosure of economic interest forms each year. The OPUC ex-officio board member and the special advisor from the Oregon Department of Energy do not receive confidential information. Once each year, board and staff members participate in a planning session to review progress and discuss Energy Trust's strategic direction. Board development is a part of this public planning session, if warranted.

2016 Advisory Council Members and Meetings

Conservation Advisory Council

Jim Abrahamson, Cascade Natural Gas
Brent Barclay, Bonneville Power Administration
JP Batmale, Oregon Public Utility Commission
Jeff Bissonnette, Oregon Solar Energy Industries Association
Holly Braun, NW Natural
Warren Cook, Oregon Department of Energy
Tony Galuzzo, McKinstry, representing Building Owners and Managers Association
Wendy Gerlitz, Northwest Energy Coalition
Charlie Grist, NW Power and Conservation Council
Garrett Harris, Portland General Electric
Julia Harper, Northwest Energy Efficiency Alliance
Scott Inman, Oregon Remodelers Association
Andria Jacob, City of Portland Bureau of Planning and Sustainability
Don Jones, Jr., PacifiCorp
Don MacOdrum, Home Performance Guild of Oregon
Tyler Pepple, Industrial Customer of Northwest Utilities
Stan Price, Northwest Energy Efficiency Council

2016 Meeting Dates	Major Discussion Topics
February 10	2015 preliminary annual results; New Buildings market solutions update, pilots
April 20	Energy-efficient cannabis production, multifamily window incentives, clean electricity and coal transition overview, smart thermostats
May 11	Home energy scoring, residential water heater delivery adjustments; transactive energy presentation by Pacific Northwest National Labs
June 22	Large customer funding, Pay for Performance
July 27	AirGenerate remediation plan, residential savings assessment, multifamily incentive structure, momentum savings presentation by Bonneville Power Administration
September 7	2017 residential incentive adjustments, draft 2017 budget and action plans by sector
October 21	Residential sector changes, draft 2017 Budget and Action Plan
November 16	2017 budget changes, residential sector changes

Renewable Energy Advisory Council

Erik Anderson, Pacific Power
Bruce Barney, Portland General Electric
JP Batmale, Oregon Public Utility Commission
Adam Schultz, Oregon Department of Energy
Jason Busch, Oregon Wave Energy Trust
Robert Grott, Northwest Environmental Business Council
Kendra Hubbard, Oregon Solar Energy Industry Association
Suzanne Leta-Liou, SunPower
Matt Mylet, Beneficial State Bank

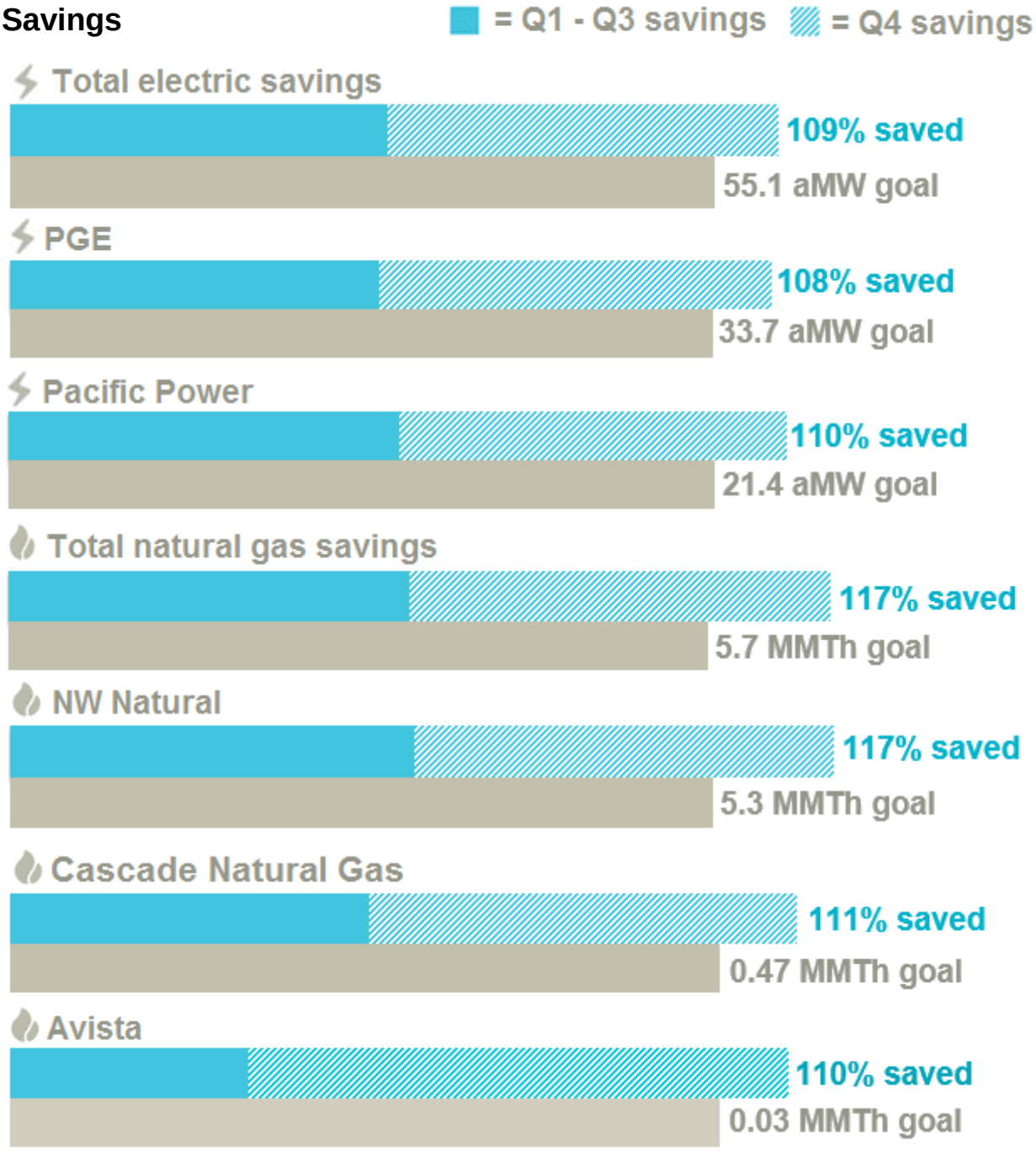
Michael O'Brien, Renewable Northwest
Les Perkins, Farmers Irrigation District
Frank Vignola, Solar Monitoring, University of Oregon
Dick Wanderscheid, Bonneville Environmental Foundation
Peter Weisberg, The Climate Trust

2016 Meeting Dates	Major Discussion Topics
February 10	2015 preliminary annual results; update on 2015 legislative session and OPUC dockets related to renewable energy; discussion about topics discussed at the council during 2015 and ideas for 2016 topics
March 16	2016 results; 1.9 MW solar project proposed for $1.25 million incentive; update and summary of legislative action
May 11	Update on Oregon Clean Power Cooperative; presentation on transactive energy by Pacific Northwest National Lab
June 22	Hydropower project proposed for $750,000 incentive; discussion of opportunities in the renewable energy space
July 27	Presentation by Sunverge on solar and storage systems; City of Portland's renewable energy and resilience work
September 7	Introduction of Energy Trust's new executive director; presentation by SolarCity on non-wires alternatives for improving grid operational efficiency; 2016 budget concepts
October 21	Draft 2017 Budget and Action Plan; Energy Trust's solar and storage pilot; review of Renewable Energy Certificate costs

APPENDIX 8: Quarter four results tables

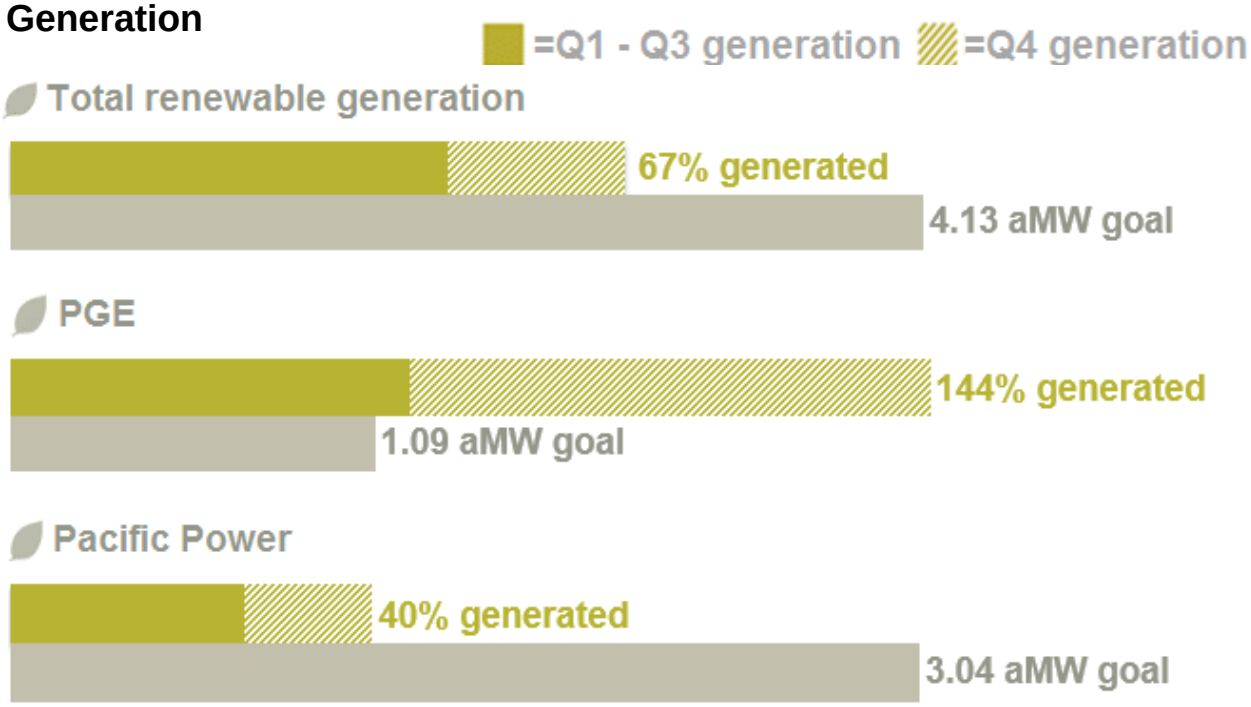
I Q4 2016 activity at a glance[22]

Savings

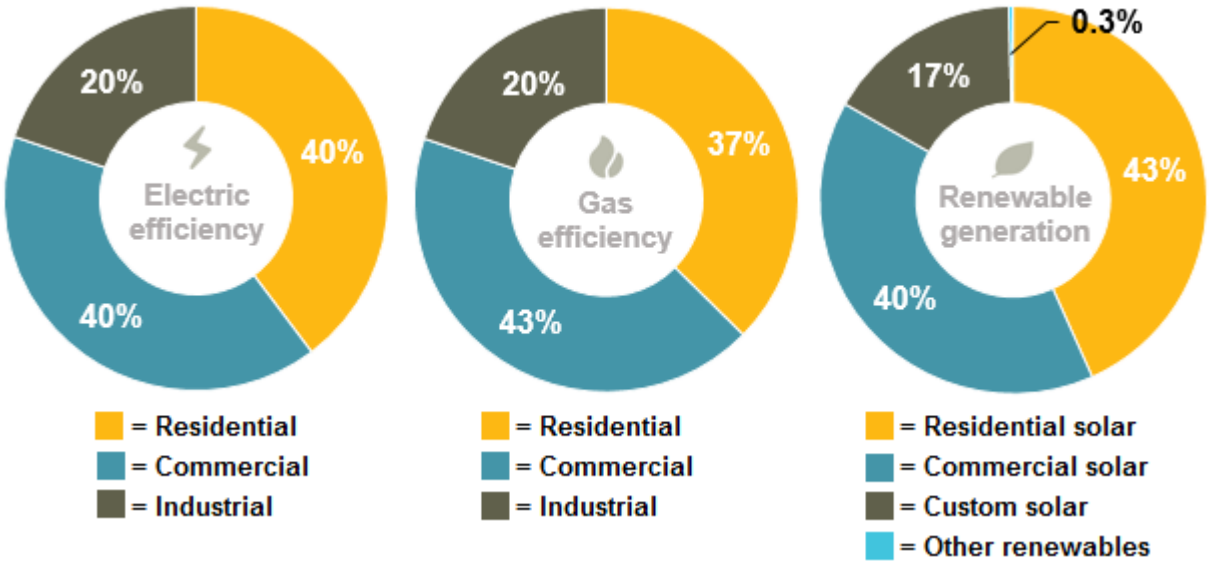


[22] This document reports net savings, which are adjusted gross savings based on results of current and past evaluations.
NOTE: aMW indicates average megawatts, MMTh indicates million annual therms and M is million.

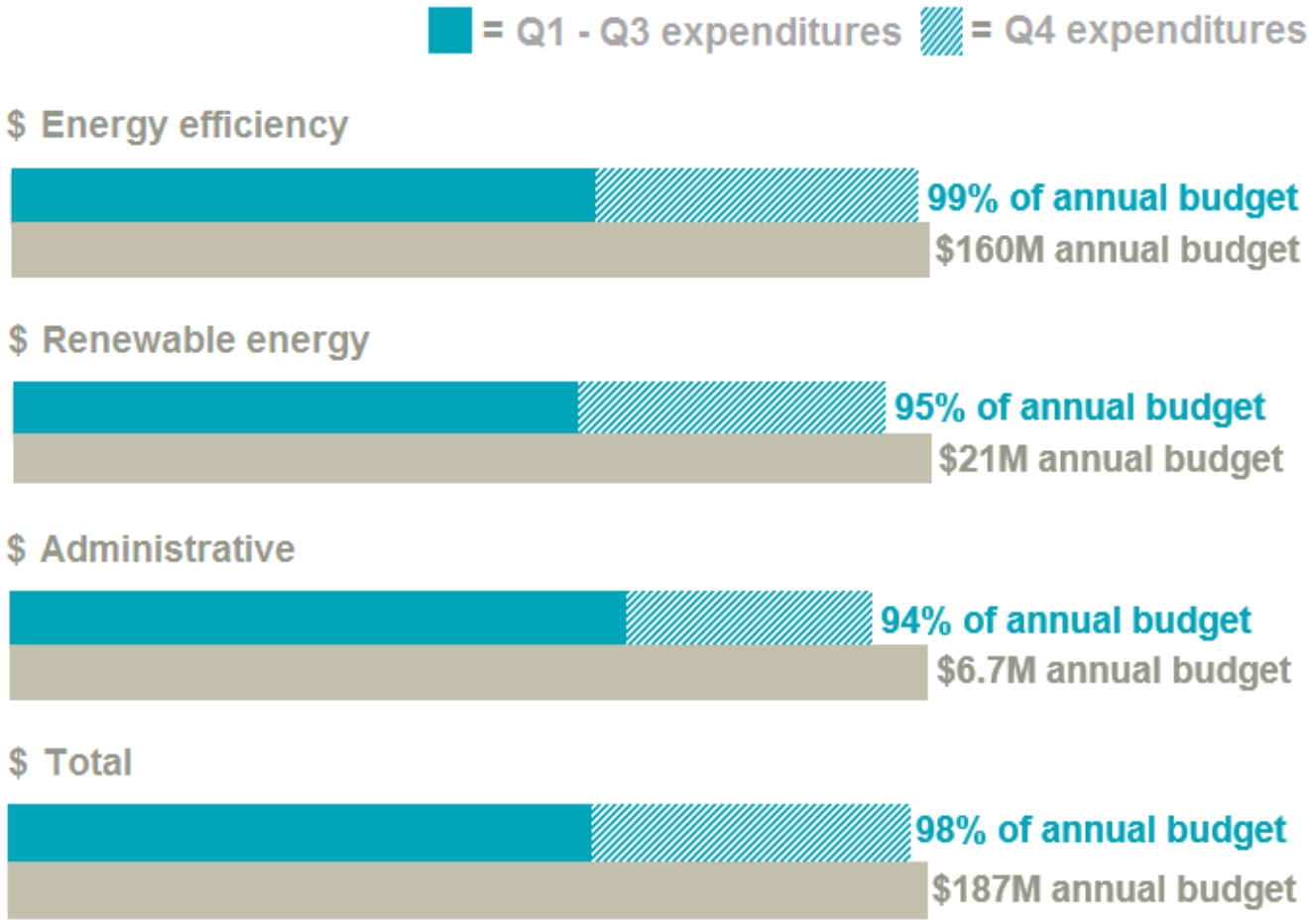
Generation



Percent of 2016 savings and generation by sector



Expenditures



Sites served by region in Q4

	Commercial	Industrial	Residential	Renewables	Total
Central Oregon	197	43	1,457	66	1,763
Eastern Oregon	46	30	141	24	241
North Coast	50	9	266	5	330
Portland Metro & Hood River	1,753	242	11,709	301	14,005
Southern Oregon	296	81	2,142	82	2,601
Willamette Valley	552	155	3,284	125	4,116
Total	**2,894**	**560**	**18,999**	**603**	**23,056**

II Revenue and expenditure tables[23, 24]

A. Revenues

Revenues includes public purpose revenue plus incremental electric revenue from SB 838. Incremental revenues are those authorized under SB 838 to support capturing additional cost-effective electric efficiency savings above the amount supported by funding through SB 1149.

Source		Q4 actual revenues		Q4 budgeted revenues
Portland General Electric	$	8,729,697	$	8,397,650
PGE Incremental	$	9,538,941	$	10,769,711
Pacific Power	$	6,532,655	$	7,318,743
Pacific Power Incremental	$	7,024,900	$	6,509,453
NW Natural	$	2,142,773	$	2,469,009
NW Natural Industrial DSM	$	1,509,018	$	1,071,908
Cascade Natural Gas	$	455,229	$	776,931
Avista	$	46,800	$	-
Total	**$**	**35,980,013**	**$**	**37,313,406**

B. Expenditures by utility

Source		Q4 actual expenditures		Q4 budgeted expenditures
Portland General Electric	$	33,015,356	$	37,905,744
Pacific Power	$	22,655,220	$	23,785,404
NW Natural	$	6,588,699	$	6,805,277
NW Natural Industrial DSM	$	1,692,509	$	2,080,408
Cascade Natural Gas	$	897,110	$	1,153,384
Avista	$	51,353	$	-
Total	**$**	**64,900,246**	**$**	**71,730,217**

As intended, Energy Trust used utility-specific program reserves to meet expenses in excess of revenue receipts, continuing to draw down program reserves in agreement with the OPUC and the utilities. By year end, Energy Trust reserves achieved targeted levels for each utility.

[23] Columns may not total due to rounding.
[24] All tables include Avista revenue and expenditures; however, Avista is not reflected in the board-approved goals. Goals were approved by the board in December 2015 whereas the addition of Avista for a transition period in 2016 did not occur until February 2016 at the direction of the OPUC.

C. Expenditures by sector and program

			Q4 actual expenditures		Q4 budgeted expenditures
Commercial	Existing Buildings and Multifamily	$	19,188,649	$	25,561,246
	New Buildings	$	5,771,463	$	5,554,430
	NEEA Commercial	$	732,681	$	748,826
	Commercial total	**$**	**25,692,793**	**$**	**31,864,502**
Industrial	Production Efficiency	$	13,428,892	$	14,459,958
	NEEA Industrial	$	49,156	$	144,507
	Industrial total	**$**	**13,478,048**	**$**	**14,604,464**
Residential	Existing Homes	$	5,592,368	$	5,973,071
	New Homes and Products	$	10,309,022	$	9,046,303
	NEEA Residential	$	1,139,969	$	1,575,648
	Residential total	**$**	**17,041,359**	**$**	**16,595,022**
	Energy efficiency total	**$**	**56,212,200**	**$**	**63,063,989**
Renewables	Solar	$	4,531,671	$	5,773,410
	Other Renewables	$	2,358,667	$	1,191,960
	Renewable generation total	**$**	**6,890,338**	**$**	**6,965,370**
Administration	**Administration**	**$**	**1,789,471**	**$**	**1,700,858**
Development	**Avista Development ***	**$**	**8,237**	**$**	**-**
	Total expenditures	**$**	**64,900,246**	**$**	**71,730,217**

*Avista development funds are temporary funds designated to develop capacity in 2016 to deliver Energy Trust services to Avista's Oregon customers in 2017. Avista development funds are separate from program delivery funds and are not associated with individual programs.

D. Incentives paid

Quarter	PGE efficiency	Pacific Power efficiency	NW Natural efficiency	Cascade Natural Gas efficiency	Avista efficiency	PGE generation	Pacific Power generation	Total
Q1	$4,288,591	$3,154,390	$1,149,249	$82,957	$0	$2,294,772	$726,292	$11,696,250
Q2	$12,929,962	$7,100,571	$2,726,806	$226,423	$0	$2,638,594	$1,421,608	$27,043,963
Q3	$10,696,488	$7,175,765	$3,067,178	$354,833	$7,955	$1,364,680	$1,940,889	$24,607,788
Q4	$20,731,322	$12,648,377	$5,729,038	$605,603	$28,452	$2,615,196	$3,538,403	$45,896,391
Total	**$48,646,363**	**$30,079,102**	**$12,672,271**	**$1,269,816**	**$36,407**	**$8,913,241**	**$7,627,192**	**$109,244,392**

III Savings and generation tables[25, 26, 27, 28]

A. Savings and generation by fuel

	Q4 savings/generation	YTD savings/generation	Annual goal	Percent achieved YTD
Electric savings	30.5 aMW	60.0 aMW	55.1 aMW	109%
Natural gas savings	3,443,343 therms	6,717,522 therms	5,721,145 therms	117%
Electric generation	0.80 aMW	2.78 aMW	4.13 aMW	67%

B. Progress toward annual efficiency goals by utility

	Q4 savings	YTD savings	Annual goal	Percent achieved YTD	Annual IRP target	Percent achieved YTD
Portland General Electric	18.8 aMW	36.5 aMW	33.7 aMW	108%	27.2 aMW	134%
Pacific Power	11.7 aMW	23.6 aMW	21.4 aMW	110%	16.8 aMW	140%
NW Natural	3.1 million therms	6.2 million therms	5.3 million therms	117%	3.9 million therms	157%
Cascade Natural Gas	280,567 therms	516,885 therms	466,577 therms	111%	447,071 therms*	116%
Avista	24,120 therms	34,708 therms	31,574 therms	110%	N/A**	N/A

*Cascade Natural Gas Integrated Resource Plan target was submitted as part of the ongoing Integrated Resource Plan process. It was not acknowledged by the OPUC and Energy Trust will work with Cascade Natural Gas on future updates.

[25] Columns may not total due to rounding.
[26] Electric savings also include transmission and distribution savings.
[27] The gas savings do not include results for NW Natural in Washington. These results are available in a separate report on activities for NW Natural in Washington at www.energytrust.org/reports.
[28] All tables include Avista revenue and expenditures; however, Avista is not reflected in the board-approved goals. Goals were approved by the board in December 2015 whereas the addition of Avista for a transition period in 2016 did not occur until February 2016 at the direction of the OPUC.

C. Electric savings by sector and program

		Q4 savings aMW	YTD savings aMW	Annual goal aMW	Percent achieved YTD
Commercial	Existing Buildings and Multifamily	7.4	16.2	15.5	105%
	New Buildings	4.1	6.8	5.3	128%
	NEEA Commercial	0.8	1.3	1.0	131%
	Commercial total	**12.3**	**24.3**	**21.8**	**111%**
Industrial	Production Efficiency	7.9	11.8	13.4	87%
	NEEA Industrial	0.1	0.1	0.1	84%
	Industrial total	**8.0**	**11.9**	**13.6**	**87%**
Residential	Existing Homes	1.1	4.2	4.0	106%
	New Homes and Products	5.7	13.9	9.9	140%
	NEEA Residential	3.4	5.7	5.8	99%
	Residential total	**10.2**	**23.8**	**19.7**	**121%**
	Total electric savings	**30.5**	**60.0**	**55.1**	**109%**

D. Natural gas savings by sector and program

		Q4 savings thm	YTD savings thm	Annual goal thm	Percent achieved YTD
Commercial	Existing Buildings and Multifamily	1,224,805	2,139,754	2,001,169	107%
	New Buildings	356,698	733,692	597,301	123%
	Commercial total	**1,581,503**	**2,873,446**	**2,598,470**	**111%**
Industrial	Production Efficiency	962,614	1,332,695	1,036,453	129%
	Industrial total	**962,614**	**1,332,695**	**1,036,453**	**129%**
Residential	Existing Homes	369,647	1,035,884	787,964	131%
	New Homes and Products	529,578	1,475,497	1,298,258	114%
	Residential total	**899,225**	**2,511,381**	**2,086,222**	**120%**
	Total natural gas savings	**3,443,343**	**6,717,522**	**5,721,145**	**117%**

E. Renewable energy generation by utility

	Q4 generation aMW	YTD generation aMW	Annual goal aMW	Percent achieved YTD
Portland General Electric	0.37	1.57	1.09	144%
Pacific Power	0.42	1.21	3.04	40%
Total	**0.80**	**2.78**	**4.13**	**67%**

F. Renewable energy generation by program

	Q4 generation aMW	YTD generation aMW	Annual goal aMW	Percent achieved YTD
Other Renewables program	0.01	0.01	0.01	100%
Solar program	0.79	2.77	4.12	67%
Total generation	**0.80**	**2.78**	**4.13**	**67%**

G. Incremental utility SB 838 expenditures[29]

Utility		2016 Q4 SB 838 Expenditures		YTD SB 838 Expenditures
Portland General Electric	$	200,899	$	784,299
Pacific Power	$	343,030	$	934,408
Total	**$**	**543,929**	**$**	**1,718,707**

H. Customer satisfaction results

Energy Trust reports annually on the OPUC's customer satisfaction performance measure, which states a minimum threshold of 85 percent of customers are satisfied overall and with program representatives. In addition, Energy Trust provides quarterly customer satisfaction results following surveys and analysis of customer feedback from participants in the previous quarter. The Q3 2016 report's survey responses from customers served in Q2 2016 are included in this report. Survey responses from customers served in Q2 2016 were delayed due to employee family leave and other unexpected staffing transitions and were not

[29] Reflects expenditures by Pacific Power and PGE in support of utility activities described in SB 838. Reports detailing these activities are submitted annually to the OPUC.

included in the Q2 report. are results from Fast Feedback surveys of these customers. The surveys asked participants about overall satisfaction with Energy Trust.

Satisfaction rates for Q2 remained consistent with past quarters. Participants in the Existing Buildings, Production Efficiency and Solar programs were also asked about satisfaction with program representatives.[30]

Customer satisfaction results for Q2 2016

From the August 2016 through February 2017, Energy Trust delivered a short telephone survey to 687 randomly selected participants in five programs who completed projects between April and June 2016. Below

Customer satisfaction results for Q2 2016

Program	Respondent Count	Percent Satisfied Overall	Percent Satisfied with Program Representative
Existing Buildings, including Multifamily	91	96%	95%
Production Efficiency	49	94%	98%
New Homes and Products[31]	128	96%	N/A
Existing Homes	364	93%	N/A
Solar	55	92%	--[32]

Customer satisfaction results for New Buildings

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 annual interviews with program participants. In early 2016, 36 New Buildings project owners or representatives were surveyed about their overall program satisfaction and satisfaction with communications with program representatives. Of participants surveyed, 100 percent were satisfied with their overall program experience. Satisfaction with program representatives was 97 percent.

Customer satisfaction results for Q3 2016

From the August 2016 through February 2017, Energy Trust delivered a short telephone survey to 576 randomly selected participants in five programs who completed projects between July and September 2016.

[30] Since residential customers have varying degrees of interaction with program representatives (many may not have any interaction), and because it is not possible to identify customers who did have interaction to survey, residential customers are not questioned on this topic.
[31] Only Products customers were surveyed. Energy Trust does not track purchasers of new homes.
[32] Only commercial solar customers are surveyed about satisfaction with program representatives. In Q2 2016, only nine commercial solar customers were surveyed, which is insufficient for reporting a percentage. All nine customers reported that they were satisfied with their interactions with Energy Trust program representatives.

Below are results from Fast Feedback surveys of these customers. The surveys asked participants about overall satisfaction with Energy Trust.

Satisfaction rates for Q3 remained consistent with past quarters. Participants in the Existing Buildings, Production Efficiency and Solar programs were also asked about satisfaction with program representatives.[33]

Customer satisfaction results for Q3 2016

Program	Respondent Count	Percent Satisfied Overall	Percent Satisfied with Program Representative
Existing Buildings, including Multifamily	89	94%	94%
Production Efficiency	47	96%	96%
New Homes and Products[34]	107	96%	N/A
Existing Homes	278	91%	N/A
Solar	55	94%	--[35]

Customer satisfaction results for New Buildings

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 annual interviews with program participants. In early 2016, 36 New Buildings project owners or representatives were surveyed about their overall program satisfaction and satisfaction with communications with program representatives. Of participants surveyed, 100 percent were satisfied with their overall program experience. Satisfaction with program representatives was 97 percent.

Customer satisfaction results for Q4 2016

From August 2016 through February 2017, Energy Trust delivered a short telephone survey to 630 randomly selected participants in five programs who completed projects between October and December 2016. Below

[33] Since residential customers have varying degrees of interaction with program representatives (many may not have any interaction), and because it is not possible to identify customers who did have interaction to survey, residential customers are not questioned on this topic.
[34] Only Products customers were surveyed. Energy Trust does not track purchasers of new homes.
[35] Only commercial solar customers are surveyed about satisfaction with program representatives. In Q3 2016, only nine commercial solar customers were surveyed, which is insufficient for reporting a percentage. Eight of 9 customers reported that they were satisfied with their interactions with Energy Trust program representatives.

are results from Fast Feedback surveys of these customers. The surveys asked participants about overall satisfaction with Energy Trust.

Satisfaction rates for Q4 remained consistent with past quarters. Participants in the Existing Buildings, Production Efficiency and Solar programs were also asked about satisfaction with program representatives.[36]

Customer satisfaction results for Q4 2016

Program	Respondent Count	Percent Satisfied Overall	Percent Satisfied with Program Representative
Existing Buildings, including Multifamily	78	91%	93%
Production Efficiency	57	98%	98%
New Homes and Products[37]	116	94%	N/A
Existing Homes	330	90%	N/A
Solar	49	88%	--[38]

Customer satisfaction results for New Buildings

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. In early 2017, 38 New Buildings project owners or representatives were surveyed about their overall program satisfaction and satisfaction with communications with program representatives. Of participants surveyed, 89 percent were satisfied with their overall program experience. Satisfaction with program representatives was 94 percent.

[36] Since residential customers have varying degrees of interaction with program representatives (many may not have any interaction), and because it is not possible to identify customers who did have interaction to survey, residential customers are not questioned on this topic.
[37] Only Products customers were surveyed. Energy Trust does not track purchasers of new homes.
[38] Only commercial solar customers are surveyed about satisfaction with program representatives. In Q4 2016, only one commercial solar customer was surveyed, which is insufficient for reporting a percentage. That customer reported that they were satisfied with their interactions with Energy Trust program representatives.

APPENDIX 9: 2016 energy efficiency results for SB 1149 and SB 838 funds

2016 SB 1149 Electric Efficiency Results	PGE aMW Saved	Pacific Power aMW Saved	Total aMW Saved		Expenses	mil $ /aMW
Commercial	6.09	4.32	10.41	$	27,411,242	$2.63
Industrial	3.94	2.8	6.74	$	16,178,917	$2.40
Residential	5.47	3.86	9.34	$	16,214,401	$1.74
Total Electric Efficiency Programs	**15.5**	**10.98**	**26.48**	**$**	**59,804,559**	**$2.26**

2016 SB 838 Electric Efficiency Results	PGE aMW Saved	Pacific Power aMW Saved	Total aMW Saved		Expenses	mil $ /aMW
Commercial	8.84	5.05	13.88	$	38,140,856	$2.75
Industrial	3.28	1.87	5.14	$	14,320,039	$2.78
Residential	8.84	5.67	14.51	$	27,308,216	$1.88
Total Electric Efficiency Programs	**20.95**	**12.58**	**33.54**	**$**	**79,769,110**	**$2.38**

2016 SB 838 Utility Expenditures	Q1	Q2	Q3	Q4	Total
Portland General Electric	$ 183,761	$ 187,386	$ 212,253	$ 200,899	$ 784,299
Pacific Power	$ 85,188	$ 314,302	$ 191,889	$ 343,030	$ 934,408
Total electric efficiency programs	**$ 268,949**	**$ 501,688**	**$ 404,142**	**$ 543,929**	**$ 1,718,707**