



Energy Trust of Oregon
Energy Efficiency and Distributed Renewables
February 26, 2020



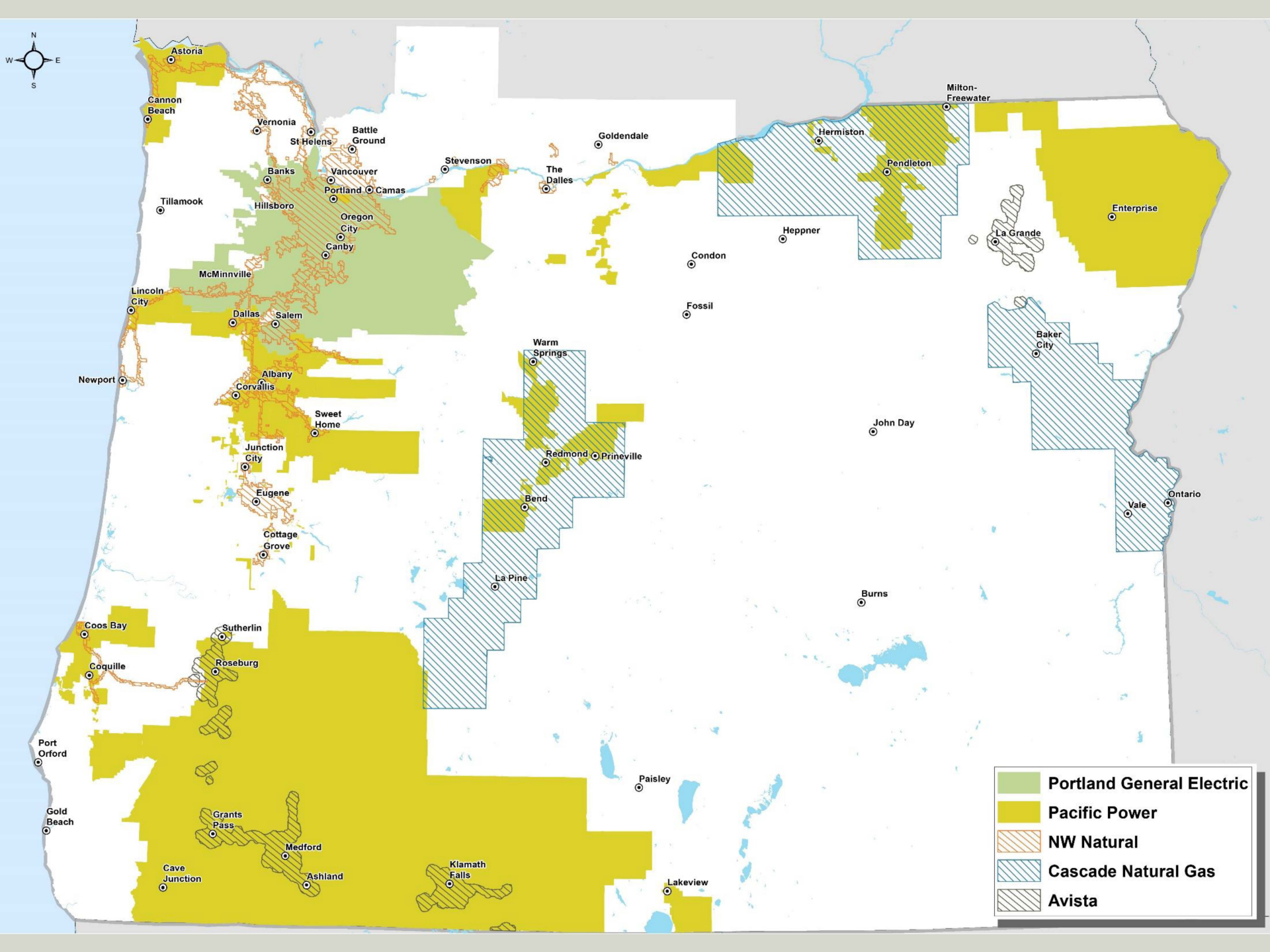
Agenda

- Energy Trust Overview
- Energy Trust Results
- Characteristics of Results
- Forecasting, Planning and Implementation

About Energy Trust of Oregon

- Independent, nonprofit organization
- Design and deliver programs that support customer investment in energy efficiency and renewable energy
- Serve 1.6 million Oregon customers of PGE, Pacific Power, NW Natural, Avista and Cascade Natural Gas
- Work with renters, homeowners, commercial and industrial businesses, agriculture, builders, developers, governments, nonprofits, trade ally contractors and community partners





Energy Trust Results

Energy Trust Savings and Generation Results 2014 - 2019

Energy Efficiency Savings (kWh)							
Utility	2014	2015	2016	2017	2018	2019*	Total
PGE	313,683,865	271,595,618	328,139,528	376,888,324	303,823,938	287,463,086	1,881,594,359
PacifiCorp	185,758,442	190,964,369	212,787,253	216,542,407	169,473,903	179,604,925	1,155,131,299
PGE + PacifiCorp	499,442,307	462,559,987	540,926,781	593,430,731	473,297,841	467,068,011	3,036,725,658
Renewable Energy Generation (kWh)							
Utility	2014	2015	2016	2017	2018	2019*	Total
PGE	7,280,013	28,170,527	13,736,055	10,422,118	11,655,838	12,764,538	84,029,089
PacifiCorp	15,171,187	8,400,595	10,581,585	28,886,159	9,271,927	11,041,342	83,352,795
PGE + PacifiCorp	22,451,200	36,571,122	24,317,640	39,308,277	20,927,765	23,805,879	167,381,883

- Energy efficiency savings are net savings
- Values for 2014-2017 have been adjusted to reflect evaluation findings

*2019 results are preliminary, Energy Trust will publish final numbers in the 2019 annual report

Peak Reduction Estimates: 2017

Net Electric Efficiency Peak Demand Reduction Estimates (MW) at Generator

Utility	Summer MW	Winter MW
PGE	39	55
Pacific Power	21	30
Total	59	84

Solar PV Generation Peak Reduction Estimates

Utility	Summer MW	Winter MW
PGE	2.4	0.4
Pacific Power	6.0	1.4
Total	8.4	1.8

Peak Reduction Estimates: 2018

Net Electric Efficiency Peak Demand Reduction Estimates (MW) at Generator

Utility	Summer MW	Winter MW
PGE	35.7	44.4
Pacific Power	18.7	23.5
Total	54.4	67.9

Solar PV Generation Peak Reduction Estimates

Utility	Summer MW	Winter MW
PGE	2.88	0.82
Pacific Power	2.61	0.38
Total	5.49	1.20

Characteristics of Results

Level of Granularity of Results

Energy Efficiency

- Many projects have site-specific information
- Mid-stream and upstream projects do not have site-specific information
- Market transformation savings are reported for all Energy Trust territory
- Energy Trust uses load shapes to make assumptions about hourly savings profiles

Renewable Energy

- All renewable energy projects have site-specific information
- Solar projects collect information on system characteristics including equipment make and model
- Solar projects have estimated hourly generation profiles based on system size, location, tilt and orientation
- A flat generation shape is used for biogas generation projects
- Generation shapes are not currently available for hydropower projects

Sharing Results with Utilities

Existing Coordination

- Quarterly & Annual reports
- Utility Custom Information (UCI) data exchange
 - Utilities provide information on customer usage
 - Energy Trust shares data on installed projects
- Renewable & Conservation Advisory Council
- Direct staff to staff coordination

Potential Coordination

- Kevala Analytics: Energy Trust has a contract with Kevala to determine the value of visualizing efficiency and solar project data with publicly available data, including tax lot and electrical grid infrastructure
 - PGE is working with Kevala on its Smart Grid Test Bed pilot areas

Solar Installations with “Smart” Inverters and Advanced Battery Storage

From 2016 -2018, 76 solar plus battery storage installations were completed, totaling 0.47 MW and 1.09 MWh capacity

Year installed	Installations with advanced inverters ³⁶	Total installations	% of annual total
2008	0	253	0%
2009	14	475	3%
2010	81	1198	7%
2011	181	1329	14%
2012	348	1,242	28%
2013	173	881	20%
2014	247	1,291	19%
2015	448	1,801	25%
2016	508	1,749	34%
2017	758	1,795	42%
2018	1,129	1,785	63%
Total	3,887	13,799	28%

³⁶ Table counts only installations that have advanced inverters that are capable of being remotely updated and programmed to provide grid services. Other installations may have inverters that can be updated manually.

Certainty of Energy Efficiency Results

- Savings are based on engineering estimates for measure installations based on project type
 - Prescriptive measures: engineering estimates of average savings that will be achieved by measure installations in a variety of conditions
 - Custom measures: custom engineering estimates based on the specific conditions where a measure will be installed
- Reliability of savings and peak reduction depends on number of installations
 - Installation of 500 heat pumps in a set area is more likely to achieve expected result than the installation of 5 heat pumps
 - If results in a set area are dependent on a large industrial site then a more in-depth study and commissioning or metering will help to alleviate uncertainty
- Energy Trust has historically adjusted reported savings to account for:
 - Engineering realization rates from impact evaluations
 - Additional savings from line losses
 - Market effects including free-ridership and spillover (Energy Trust will discontinue this practice beginning in 2020)

Certainty of Renewable Generation Results

- Solar projects are modeled using historical solar irradiance data, installed equipment and site specific information
 - Evaluations indicated that installed projects generated more than previously estimated so the estimation methodology was updated
 - The reliability of estimated generation and peak savings for solar sites increases over longer periods of time
- Biopower, hydropower, geothermal and community-scale wind generation is estimated and documented in a funding agreement
 - Projects that fall below minimum generation are subject to payback provisions
 - Reliability of estimated generation from these projects is based on the availability of the renewable energy resource
 - Projects with intermittent resources will demonstrate increased reliability over longer periods of time

Forecasting, Planning and Implementation

Forecasting

- Energy Trust works with utilities to produce 20-year energy efficiency forecasts for utility IRPs
 - Forecasts include savings and peak reduction estimates
 - Forecasts are generated for the broader service territory area
 - Renewable energy projects are not included in regular IRP forecasting
- Annually, Energy Trust produces a 2-year budget and forecasts annual results for the current year in Q2 and Q3 for both efficiency and renewable projects
 - Energy savings forecasts are based on projects in the pipeline and estimates of additional projects that can be acquired by year-end
 - Solar generation forecasts are based on the number of projects that can be brought in at the given incentive level within the set annual budget
 - Other Renewables* projects are based on:
 - Projects that have funding agreements and the estimated project operation date
 - Additional budget availability to serve projects in the pipeline

*Other Renewables program includes small-scale biopower, hydropower, geothermal and community-scale wind

Targeted Delivery of Offerings

- Working to increase access to programs in alignment with Energy Trust's Diversity, Equity and Inclusion initiative
 - Lower-income populations
 - Communities of color
 - Small businesses
 - Rural communities
- Supporting communities that are engaging in energy planning to implement their goals
- Running or supporting "Solarize" campaigns
- Coordinating with utilities to address load constraints or test installation of technology to understand the impact on the grid

Targeted Load Management with PacifiCorp

- Work with PacifiCorp to investigate whether efficiency and solar projects can effectively defer investments in distribution system upgrades
- Two areas within Energy Trust territory: Santiam and Medford
- Targets have been set to achieve specific local peak load reduction goals
 - Actual results are measured against the targets

PGE Smart Grid Test Beds

- Coordination with PGE in support of Smart Grid Test Bed pilots
- Locations include parts of Hillsboro, Milwaukie and Portland
- Focused on increasing adoption of demand response capable technology on specific distribution feeders
- Technologies of interest include efficiency, solar, battery storage, utility-led demand response and areas of overlap

Customer Accessibility and Inclusivity

- Energy Trust has 10 goals in the Energy Trust Diversity, Equity and Inclusion Operations Plan
- Applying a DEI lens to program design, among other operations activities
- Formed a Diversity Advisory Council
- Working with community-based organizations to inform program approaches or to directly engage communities
- Increasing awareness with outreach to rural communities, increased accessibility on website and more translated materials



Thank You

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Oversight and Requirements

Accountable to Oregon Public Utility Commission

Contracts with utilities to deliver energy resources

Cost-effectiveness and utility system benefit required

- Benefits (defined by OPUC) must exceed the costs for all incentives and programs
- Costs must be lower than other energy sources to benefit all ratepayers

OPUC Performance Measures

- Minimum energy acquisition goals for each utility
- Administrative and program support costs
- New diversity, equity and inclusion measures for 2020

