Agenda

Renewable Energy Advisory Council
Wednesday, February 27, 2019: 9:30 a.m. – Noon
http://www.energytrust.org/about/public-meetings/renewable-energy-advisory-council-meetings/

Energy Trust conference room Megawatt
421 SW Oak St., Suite 300
Portland, Oregon 97204

9:30 **Welcome, introductions, announcements** **Information**

9:35 **Solar program strategies to support high value installations** **Information**

- Staff will present on how the Solar program is adapting to focus on projects that provide higher value to the grid and communities.

10:25 **Preliminary year-end results** **Information**

- Staff will present preliminary figures for Energy Trust's results in renewable energy and energy efficiency for 2018 and discuss what the results mean for work in 2019.

10:40 **Break**

10:50 **Residential Net Zero Specification** **Discussion**

- Staff will lead early stakeholder engagement on program concepts, review different approaches to net zero, and seek feedback on how or whether to introduce a new combined energy efficiency and solar program design. The CAC will also weigh in at its meeting.

11:45 **Public comment**

12:00 **Adjourn**

You can view this agenda and notes from previous meetings at:
http://www.energytrust.org/about/public-meetings/renewable-energy-advisory-council-meetings/.
If you have comments on meeting notes, please alert Jed Jorgensen at jed.jorgensen@energytrust.org.

Next RAC meeting:
Wednesday, April 10, 2019

EXECUTIVE ORDER NO. 17-20

ACCELERATING EFFICIENCY IN OREGON'S BUILT ENVIRONMENT TO REDUCE GREENHOUSE GAS EMISSIONS AND ADDRESS CLIMATE CHANGE

WHEREAS, climate change presents a significant threat to our livelihoods, economic security, environment, health, and well-being.

WHEREAS, there has been an increase in extreme weather events, including more frequent and intense heat waves and wildfires. According to the Oregon Climate Change Research Institute and other regional studies, the best available science indicates Oregon is at risk of serious impacts to its natural resources due to climate change.

- Water resources are being affected by decreased winter snowpack, changes to seasonal runoff patterns, decreased precipitation in Eastern Oregon, and increased intensity and occurrence of flooding.
- Agricultural resources are being affected by increases in temperatures.
- Ocean acidification is increasing and there are changes in ocean currents.
- Significant parts of the Oregon coastal region, stretching 363 miles, will be impacted by an expected rise in sea level up to 1 to 4 feet by 2100, incurring billions of dollars of damages and losses to roadways and structures.
- Climate change impacts threaten the State's agricultural, fishing, timber, recreation, and tourism industries, thereby threatening the livelihood of the State's residents and an important source of Gross State Product for the state.

WHEREAS, energy efficiency leads to significant greenhouse gas reductions that are essential to meeting our state greenhouse gas reduction goals and addressing climate change.

WHEREAS, Oregon is committed to meeting the international Paris Agreement targets to reduce greenhouse gas emissions by 26 to 28 percent below 2005 levels by 2025.

WHEREAS, Oregon has adopted goals to reduce greenhouse gas emissions to 10 percent below 1990 levels by 2020 and at least 75 percent below 1990 levels by 2050 as described in ORS 468A.20.

WHEREAS, saving energy by using less energy in buildings is one of the least cost ways to achieve emissions reductions in the energy system – often with a net financial savings over the life of these energy efficiency measures, in particular as energy efficiency technology continues to improve.

WHEREAS, studies have found that building codes in Oregon have had a 97 percent compliance rate; and as building codes become more energy efficient, we will continue to strive toward excellence in construction and building codes, which are applicable statewide and provide uniformity and predictability for building owners and contractors and equity for residents and businesses.

WHEREAS, Oregon is an international leader in energy efficiency, has in-state energy efficiency expertise, and a skilled workforce to continue to be a leader; and Oregon can build on its reputation through emphasis on state leadership, building codes for newly constructed buildings, and retrofits for existing buildings.

WHEREAS, energy efficiency is a critical and growing portion of the State's clean energy economy. Investments in energy efficiency sustain a workforce of over 40,000 jobs statewide; 70 percent of these are small businesses with 11 employees or fewer. Investments in energy efficiency result in an average annual increase of gross state product of over $132 million, and the resulting reduction in energy costs generates an additional $32 million per year.

WHEREAS, low income and other underserved communities often struggle to access energy efficiency programs that will save them money and improve housing quality over the long-term and the State can take steps to implement policies that increase the availability of energy efficiency to these residents.

WHEREAS, state government has a responsibility to lead by example in its adoption of energy efficiency to achieve a more cost-effective and clean energy future.

WHEREAS, energy efficiency actions increase the health, safety, and resiliency of Oregon's buildings and homes, resulting in lower health care costs borne by the State and its residents.

WHEREAS, an energy system with distributed generation, energy efficiency, and storage capacity can build resiliency in the face of climate change related disruptions and other disasters.

NOW, THEREFORE, IT IS HEREBY DIRECTED AND ORDERED:

1. **Definition.** For purposes of this Executive Order, "state agency" shall be defined as any agency within the Executive Department as defined in ORS 174.112, other than the Oregon Secretary of State, Oregon State Treasury, Oregon Department of Justice, and Oregon Bureau of Labor and Industries.

2. **Statement of Policy.** It is the policy of the State of Oregon to establish an aggressive timeline to achieve net zero energy ready buildings as a standard practice in buildings across the state. Review and regular improvements to the energy provisions of the state building code will occur on at least a three-year cycle for residential and commercial buildings. Directives in this Executive Order related to energy efficiency, electric vehicle readiness, and solar installation readiness are essential to meeting this policy, as is a focus on retrofitting older, less-efficient buildings and demonstrating energy efficiency leadership in state-owned and state-leased buildings.

3. **Energy Efficiency Leadership in State Buildings**

   A. High Performance Energy Targets for Existing State Buildings. State agencies will use high performance energy use targets for remodels in all existing state-owned buildings. Department of Administrative Services (DAS) and Oregon Department of Energy (ODOE) are directed to consider ASHRAE 100 Standard pathways and work with all state agencies to adopt targets for any remodels that begin after the date of this executive order. State agencies that are not meeting energy use targets will work with ODOE and DAS to undertake energy retrofits to increase the efficiency of their buildings. ODOE is directed to report on and track all state-owned building energy use to guide agencies to implement tactical and achievable energy use reductions. ODOE will work with all agencies to benchmark and identify buildings for retrofits. A database of all eligible state-owned buildings will be created by June 1, 2018.

B. Carbon-Neutral Operations for New State Buildings. DAS and ODOE are directed to work with state agencies to ensure that new state owned buildings permitted after January 1, 2022 and used primarily for office and other commercial work space are designed to be able to operate as carbon-neutral buildings defined with full fuel-cycle considerations that are inclusive of, but not limited to, off-site renewable energy and other provisions of ASHRAE standard 189.1. In addition, DAS and ODOE are directed to analyze feasible options with the Department of Environmental Quality that would lower the embodied carbon of building materials in new construction of state buildings.

C. Statewide Plug-Load Strategy. DAS and ODOE are directed to develop a statewide plug-load management strategy and strategies for other occupant behavior changes to reduce energy uses not regulated by codes and standards. DAS and ODOE will develop a plug load strategy by January 1, 2019, and DAS will update policies for behavior-based efficiency by January 1, 2020.

D. Energy Efficient Equipment. DAS, with support from ODOE, is directed to ensure that all equipment purchased by the state meets high-efficiency energy and water use specifications by incorporating efficiency standards into procurement requirements. DAS and ODOE will develop procurement requirements in the 2018-19 fiscal year.

E. Lifecycle Cost Analysis. ODOE is directed to analyze state building costs, including lifecycle energy and water use costs or savings, when considering energy and water upgrades for state buildings. By January 1, 2019, ODOE, working with DAS, will develop analysis tools that can inform the high performance energy use targets and carbon neutral requirements for state buildings referenced above.

4. Increasing Energy and Water Efficiency in New Construction Across the State

A. Solar Ready Building Construction. The appropriate advisory board(s) and the Department of Business and Consumer Services Building Codes Division (BCD) are directed to conduct code amendment of the state

building code to require all newly constructed buildings will be ready for the installation of solar panels and related technologies by October 1, 2020 for residential structures and October 1, 2022 for commercial structures. BCD may establish limited specific exemptions to this solar-ready policy for buildings where solar applications are infeasible.

B. Electric Vehicle Ready Building Construction. The appropriate advisory board(s) and BCD are directed to conduct code amendment of the state building code to require that parking structures for all newly constructed residential and commercial buildings are ready to support the installation of at least a level 2 EV charger by October 1, 2022. BCD may establish limited specific exemptions related to types of parking lots, such as temporary parking lots.

C. Zero-Energy Ready Homes. The appropriate advisory board(s) and BCD are directed to conduct code amendment of the state building code to require newly constructed residential buildings to achieve at least equivalent performance levels with the 2017 U.S. Department of Energy Zero Energy Ready Standard by October 1, 2023.

D. Increasing Energy Efficiency in Commercial Construction. The appropriate advisory board(s) and BCD are directed to conduct code amendment of the state building code to require, by October 1, 2022, that newly constructed commercial buildings, averaged across building types, will exceed International Energy Conservation Code and ASHRAE 90.1 by achieving at least equivalent performance levels with the measurable prescriptive energy efficiency portions of the most current version of ASHRAE 189.1 that are construction-related.

E. Helping Key, Expanding Industries to Save Costs by Reducing their Energy Footprint. ODOE, in consultation with BCD, is directed to work with industry stakeholders to identify key high-energy use industries that have the potential to realize significant cost savings and energy savings through building code amendments as it relates to their industrial building types. ODOE and BCD are directed to provide the Governor with a report of its analysis and findings by January 1, 2019.

F. Improved State Standards for Appliances. ODOE is directed to work with appliance industry stakeholders to identify categories of appliances for improved efficiency standards, while considering appliance standards of other states, potential efficiency gains, potential costs, and supply chains for the regional market for appliances. ODOE is directed to provide the Governor with a report of its analysis and identify categories of appliances for improved efficiency by November 1, 2018.

G. High Efficiency Water Fixtures. The appropriate advisory board(s) and BCD are directed to conduct code amendment of the state building code to require high-efficiency water fixtures in all new buildings by January 1, 2020.

H. Increased Water Efficiency in On-Site Reuse. The appropriate advisory board(s) and BCD are directed to conduct code amendment of the state building code to require water efficiency improvements in all newly constructed commercial buildings through standards for capture and safe reuse of water for irrigation purposes by October 1, 2025.

5. Increasing Energy Efficiency through Retrofits of Existing Buildings Across the State

A. Energy Trust of Oregon Pilot Programs. Oregon Public Utility Commission (PUC) is directed to work with the Energy Trust of Oregon and interested stakeholders to expand meter-based savings pilot programs, including pay-for-performance pilot programs, by January 1, 2019. PUC shall consider inclusion of pilot programs, which do not significantly raise energy efficiency delivery costs, and that focus on existing single family homes, multi-family residential buildings, commercial buildings, and methods to incentivize energy efficiency in building stock that is significantly below current building code requirements.

B. Prioritizing Energy Efficiency in Affordable Housing to Reduce Utility Bills. ODOE, PUC, and Oregon Housing and Community Services (OHCS) are directed to work together to assess energy use in all affordable housing stock and develop a ten-year plan for achieving

maximum efficiency, as well as a continuum of efficiency levels up to maximum efficiency in affordable housing across the state by January 1, 2019. As part of the assessment, the agencies shall consider new resources and best practices and shall seek assistance from Energy Trust of Oregon and Bonneville Power Administration. OHCS is directed to expand its existing multi-family energy program and green energy path requirements, including a manufactured home replacement program through pilot programs and initiatives, while considering multiple values from energy efficiency improvements, such as health and habitability.

C. Coordination of Data. ODOE and PUC are directed to support and assist private sector partners in efforts to coordinate sharing of data that shows projected energy use reductions in the region. This data will be made available to the public to inform energy efficiency policies, as appropriate, by January 1, 2020.

D. Evaluation of Energy and Resiliency Efforts. ODOE and PUC are directed to evaluate the state's distributed energy resources and the efficiency of energy systems needed to improve Oregon's recovery from a disaster situation. ODOE and PUC are directed to provide the Governor with a report of their analysis and findings by January 1, 2019.

6. **Analysis of Cost**. State agencies are expected to implement this Executive Order using the least cost methods available. ODOE and BCD, in consultation with DAS, PUC, and OHCS, are directed to adopt a cost-analysis tool through a process that involves meaningful public input by December 1, 2019. State agencies shall use this cost analysis tool to determine whether any directive in this Executive Order should be deferred for one year or, if specific to a building code related directive, to the next building code cycle, due to significant cost at the time of implementation of that directive. All state agency processes for determining deferment of a directive in this Executive Order must include at least one public meeting that allows interested stakeholders to provide input.

7. **Implementation.** The implementation of this Executive Order shall be coordinated through a Built Environment Efficiency Working Group, which will also identify any structural barriers or barriers to information sharing that may slow the progress of any directive in this Executive Order. The Built Environment Efficiency Working Group will review directives in this Executive Order, seek input from interested stakeholders, and recommend opportunities to provide equitable access to clean energy by removing barriers to achieving energy efficiency in the built environment to the Governor and state agencies. The Built Environment Efficiency Working Group shall include the following agencies: DAS, ODOE, BCD, PUC, and OHCS. Agencies shall implement each directive in this Executive Order using their existing internal processes and established rulemaking procedures, including recommendations from any boards. This Executive Order is intended to be consistent with obligations under federal and state law and shall be interpreted as to not violate any requirement of federal or state law.

8. The Governor encourages the Secretary of State, the State Treasurer, the Attorney General, and the Commissioner of the Bureau of Labor and Industries to adopt policies and practices to accelerate efficiency in the built environment consistent with measures in this Executive Order. DAS and ODOE are directed to assist the above-mentioned officials and entities of state government in accomplishing these objectives as they may request.

Done at Portland, Oregon, this 10th day of November, 2017.

Kate Brown
Kate Brown
GOVERNOR

ATTEST:

Dennis Richardson
Dennis Richardson
SECRETARY OF STATE

Residential Net Zero Specification

Early Stakeholder Engagement

February 27, 2019

Energy Trust of Oregon

Agenda

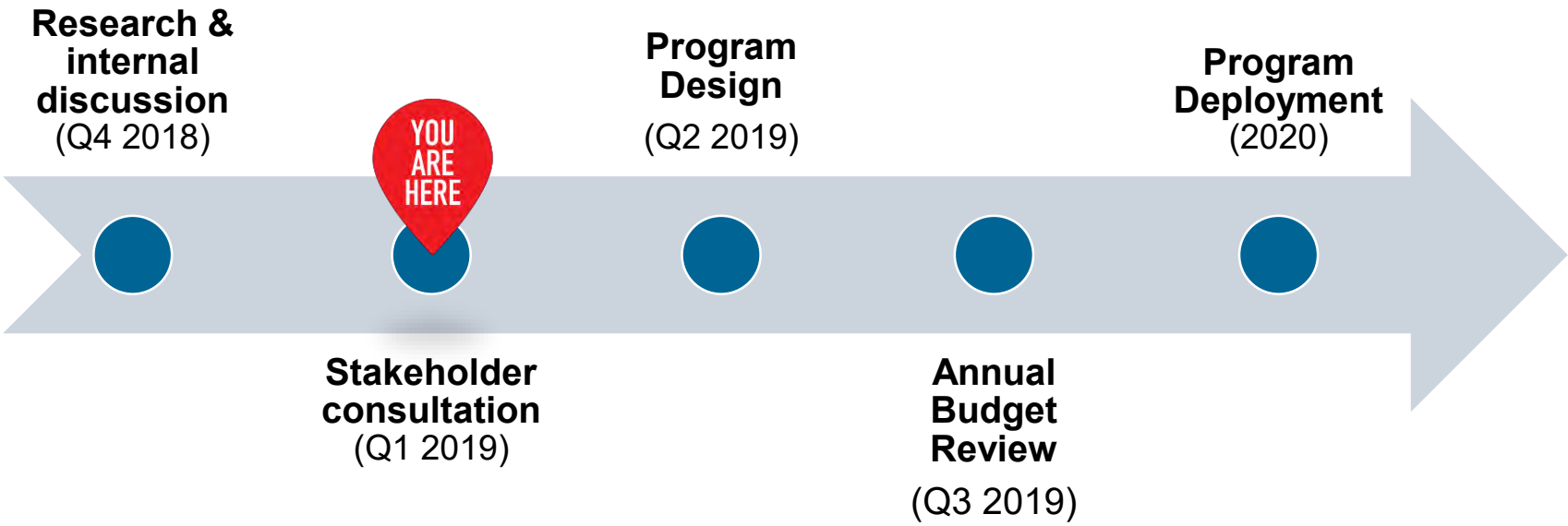
- Background
- Definitions
- Discussion

Background

Discussion Assumptions

- Target launch in 2020
- Fuel neutral
- Site based savings analysis
- No offsite renewable offsets
- Current net metering rules

Process


Research & internal discussion
(Q4 2018)
YOU ARE HERE
Stakeholder consultation
(Q1 2019)
Program Design
(Q2 2019)
Annual Budget Review
(Q3 2019)
Program Deployment
(2020)

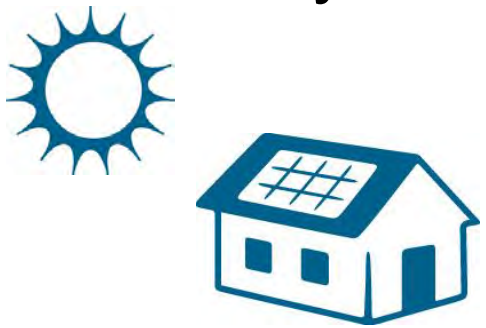
Residential New Construction and Solar Program Overview

EPS New Construction

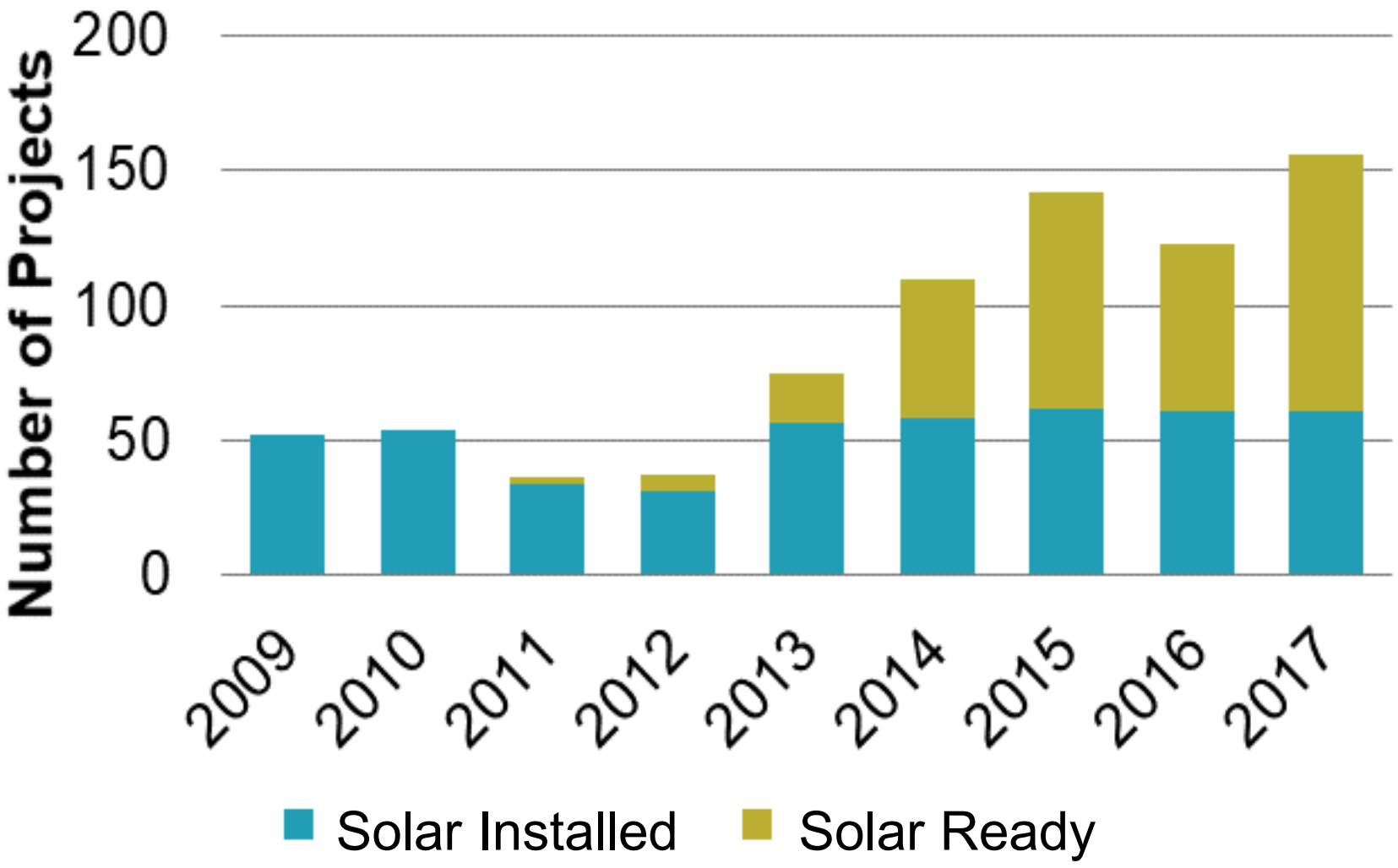
- Energy efficiency incentives based on therm and kWh cost effectiveness
- Supports energy-efficient improvements beyond code
- Launched in 2009 for new homes
  - More than 13,000 homes have received an EPS
- Builders works with trade ally verifiers from design phase through final verification
- Incentives based on modeled, site-based whole home savings

Solar

- Solar incentives based on above market cost
- Solar Trade Ally Contractors can offer solar incentives for commercial and residential systems
- All solar installations must meet Energy Trust above code requirements
- Incentives lower the upfront cost to the builder
- Homebuyers receive federal tax credits for solar
- New homes can also receive an incentive for being built to meet Energy Trust Solar Ready standards

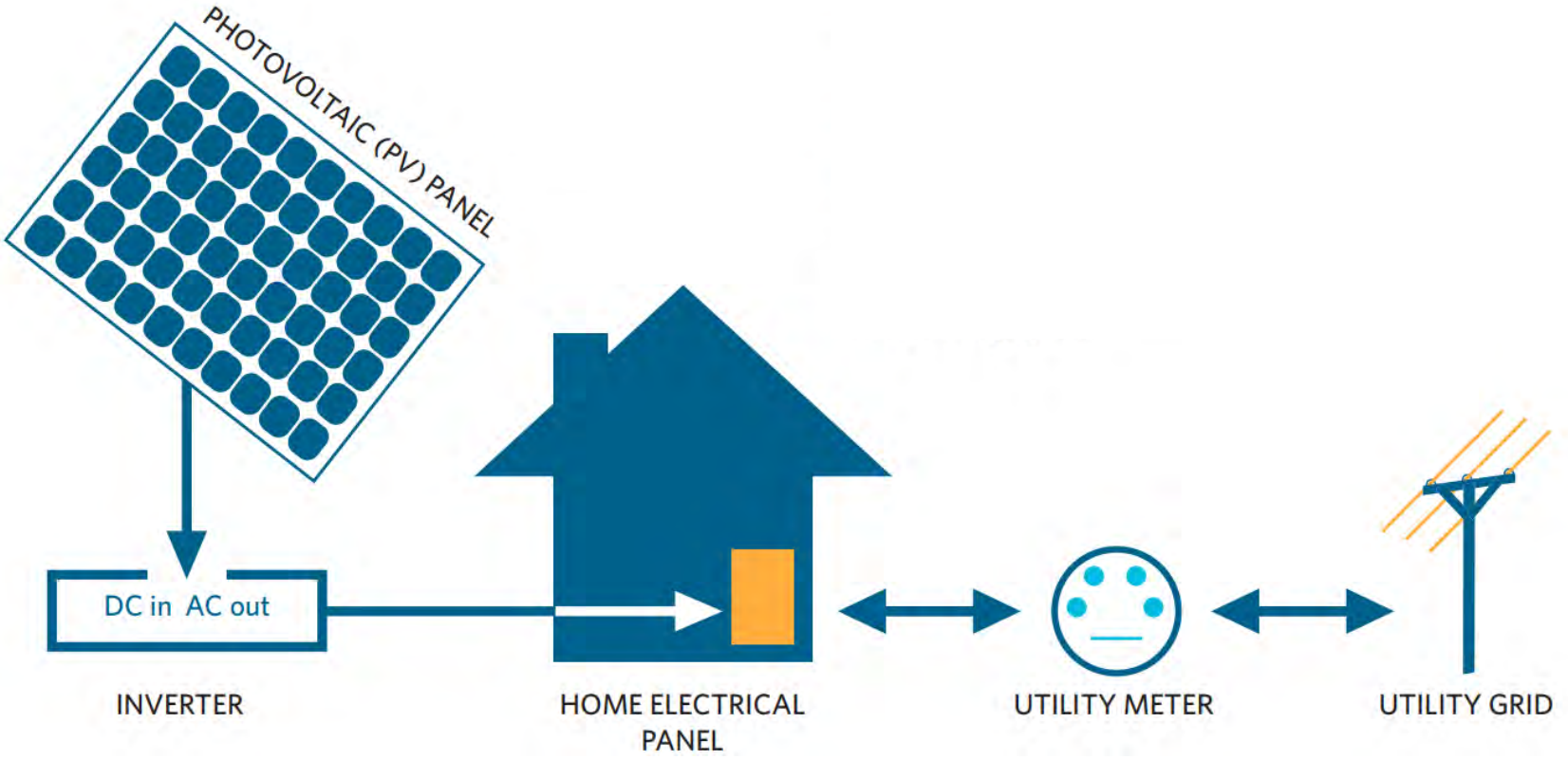


Solar - New Homes Market

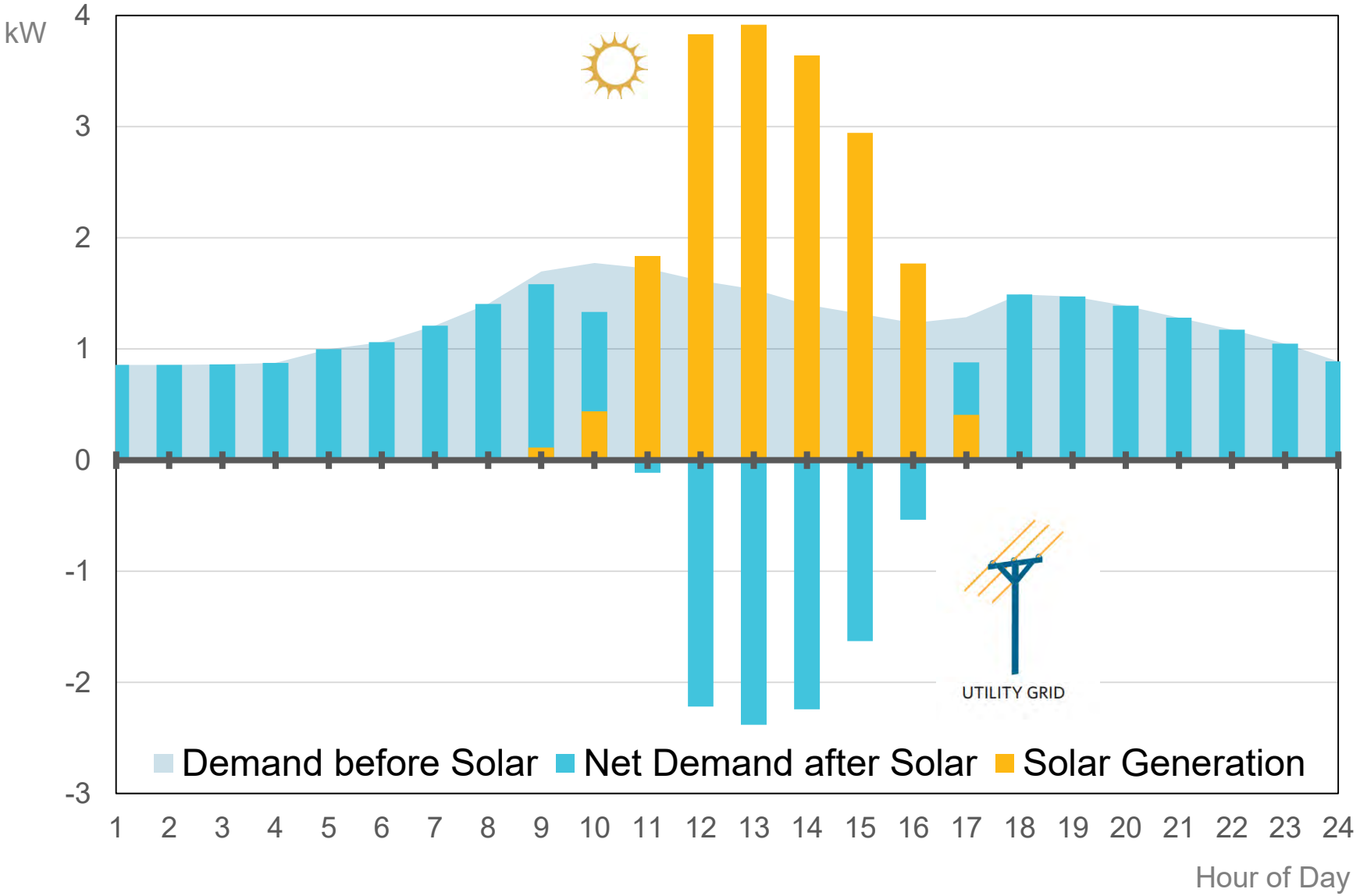


Solar – Annual Net Metering

- Solar offsets electricity (kWh) usage at the home.
- Surplus solar energy is converted to kilowatt hour credits that are applied to future electric bills.



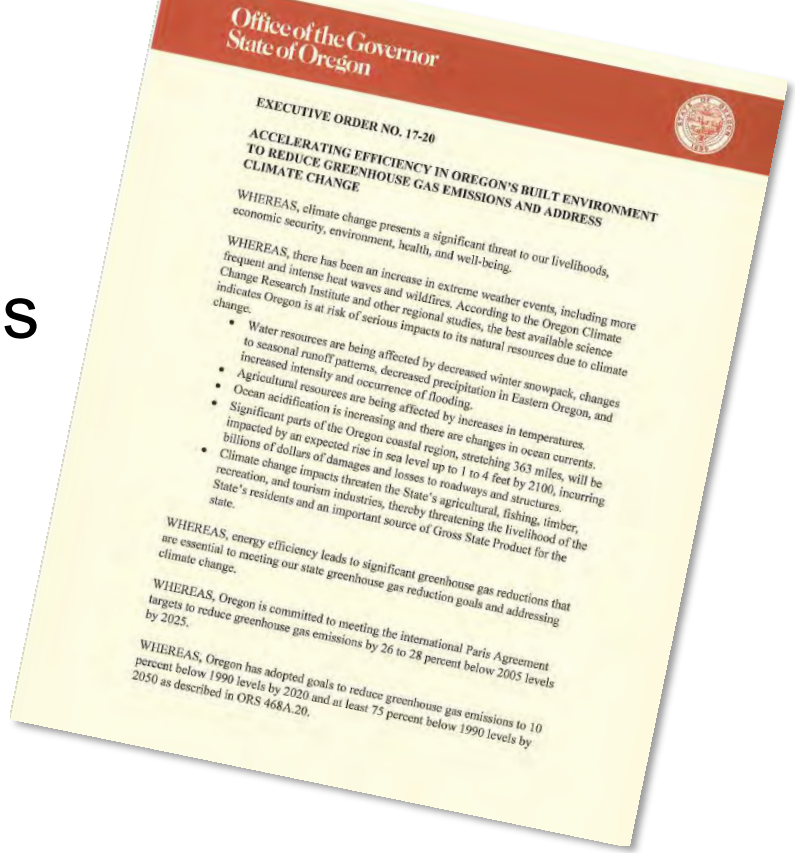
Solar – Daily Production



Market Context for Residential Net Zero

Executive Order 17-20

- Residential Building Codes Timeline



Office of the Governor
State of Oregon

EXECUTIVE ORDER NO. 17-20

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Executive Order 17-20

Nov. 2017

Oct.2020

- Solar Ready

- EV Ready

Zero Energy Ready

Oct. 2023

Next?

Value Proposition of Net Zero for Energy Trust

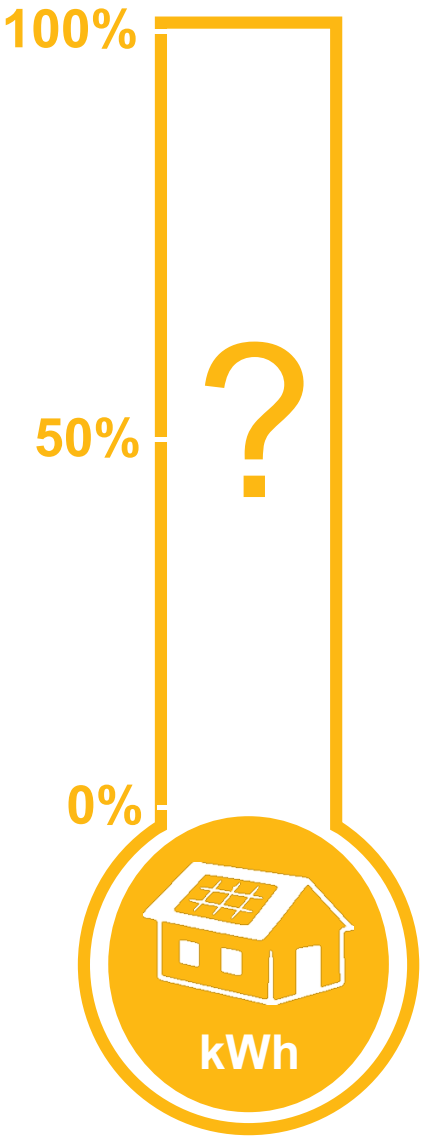
- Increase adoption of energy efficiency and solar
- Decrease cost of building energy efficient homes with solar
- Boost consumer confidence
- Build brand awareness

Definitions

What is net zero?

What is net zero?

- Zero all energy usage
- Zero all electric usage
- Zero some usage (California Code)
- *Smart Grid Responsive Home



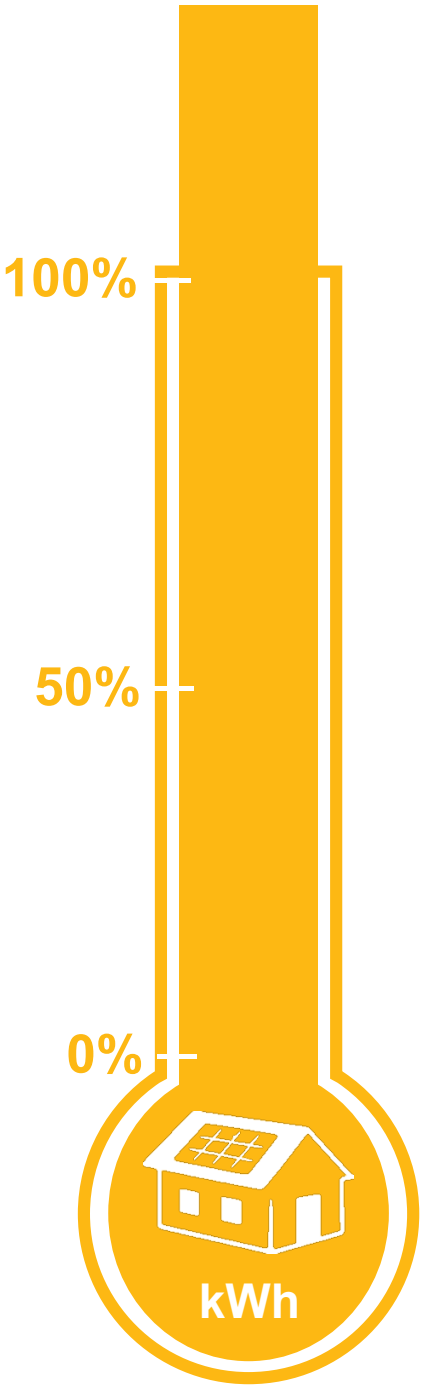
Zero all energy usage

Description

Annual energy usage onsite - both gas and electric – is converted to BTU and the solar array is sized to offset that combined total.

Considerations

- For mixed fuel homes, solar system generates more electricity than the home uses over a year
- Homebuyer does not receive the full benefit of their solar investment because any excess electricity is donated
- Home's electric bill is "zero"



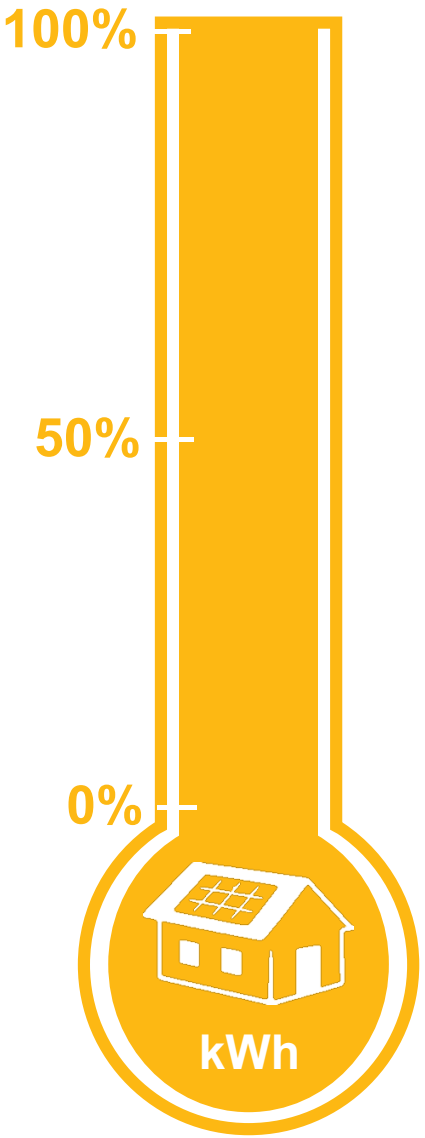
Zero all electric usage

Description

Annual electricity usage onsite is modeled and the solar array is sized to offset that total

Considerations

- For mixed fuel or all electric homes, solar system generates only enough electricity to offset the homes annual electric usage.
- Homebuyer does receive the full benefit of their solar investment
- Home's electric bill is "zero"



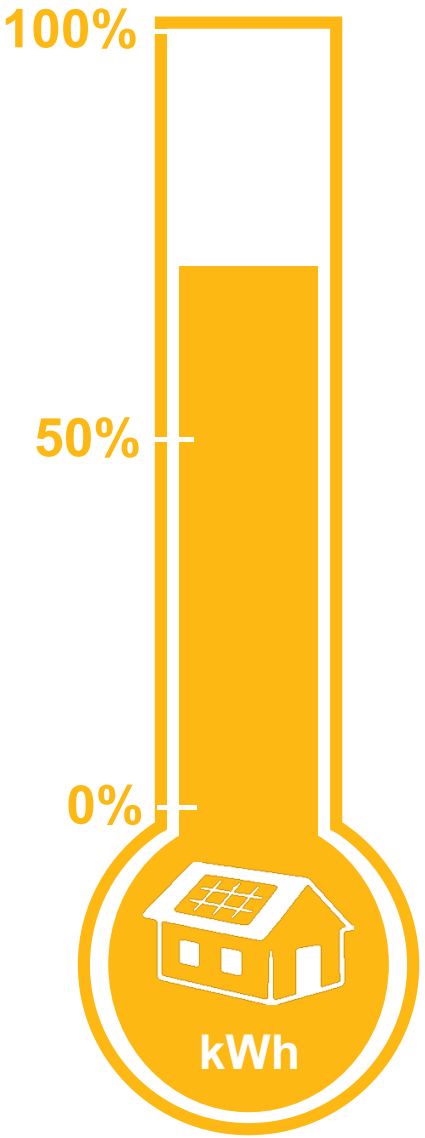
Zero some usage (California Code)

Description

Annual energy usage onsite - both gas and electric – minus the typical water heating and space heating loads is converted to BTU and the solar array is sized to offset the remaining total.

Considerations

- For mixed fuel or all electric homes, solar system generates less electricity than the home uses over a year
- Homebuyer does receive the full benefit of their solar investment
- Home's electric bill is not "zero"



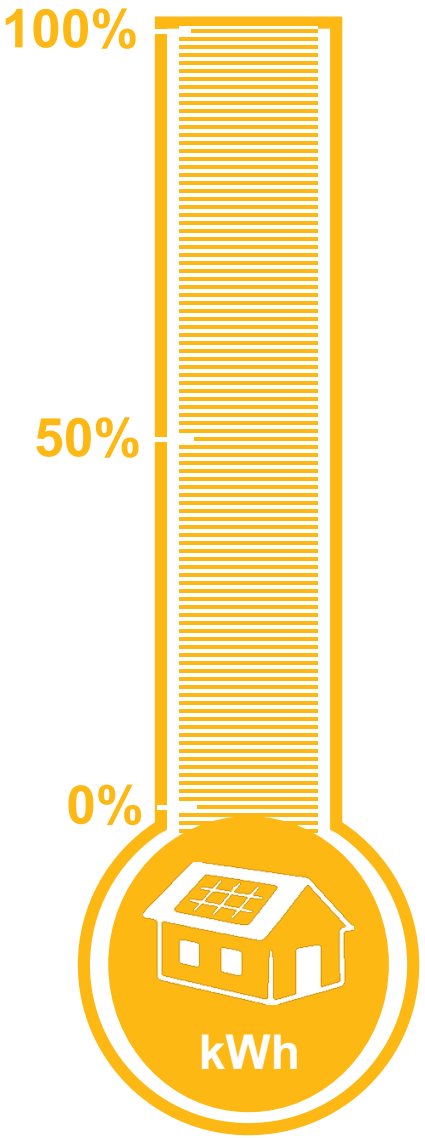
*Smart Grid Responsive Homes

Description

A program overlay that provides a menu of smart grid capable technology for builders to incorporate into their project that can benefit homebuyers and the electric grid.

Considerations

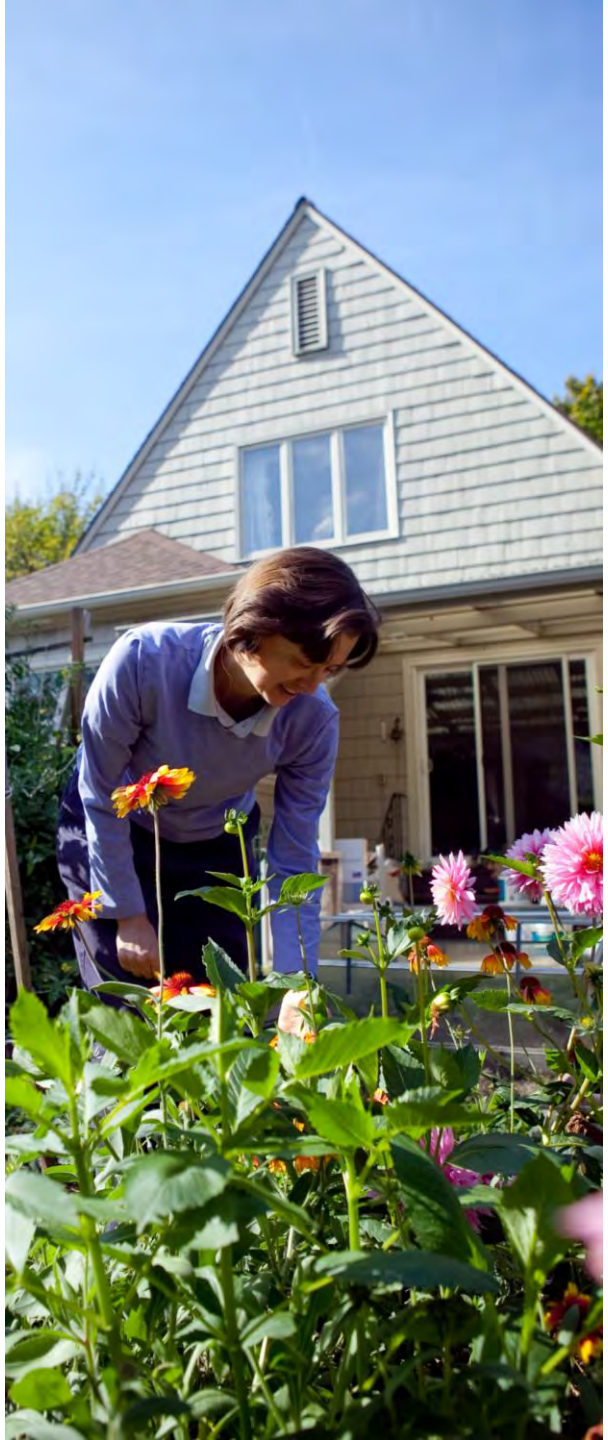
- Net Zero homes can cause excess solar generated during the day to “back feed” on the grid and contribute to an increase in evening peak.
- Combining energy efficiency, solar, and other smart grid enabled technology can make the home into a flexible resource which utilities can “activate.”



Discussion

Discussion Questions

1. What does net zero mean to your organization?
2. What should be taken into consideration when designing a residential net zero specification?
3. Of the options on the previous slides which do you feel is most appropriate for Energy Trust to consider?



Survey Questions

1. Residential net zero is a valuable framework to advance the goals of the EPS and solar programs
2. Residential net zero is a valuable framework to support Energy Trust's customers
3. Residential net zero is a valuable framework to support Energy Trust's trade allies
4. Energy Trust should have a role in shaping net zero in the residential context

Thank you

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Energy Trust of Oregon