Oregon Energy Strategy
Building Electrification, Energy Efficiency, and Distributed Energy Resources Policy Working Group

Meeting 2

March 5, 2025, 9:00-12:00

Post-Meeting Notes

Meeting Summary

Rob Del Mar and Stephanie Kruse (ODOE) presented on four key findings of the energy pathways modeling to inform the policy discussions of the Building Electrification, Energy Efficiency, and Distributed Energy Resources Policy Working Group (PWG). These findings pertain to high costs associated with delaying energy efficiency and building electrification, BE's role in reducing system-wide energy demand, the role of rooftop solar in Western Oregon in displacing a need for Eastern Oregon grid-scale solar development, and the role of DR programs in reducing future energy capacity and transmission needs. Rob, Stephanie, and Ruchi Sadhir (ODOE) facilitated digital whiteboard exercises for PWG members to brainstorm barriers and issues related to the key findings and pathways presented by the modeling. ODOE is reviewing the discussions and brainstormed materials from the PWG to prepare for Meeting 3 of the PWG, which will focus on discussing existing Oregon policies related to the issues and barriers brainstormed in this Meeting 2.

In-Meeting Notes

Participants

ODOE	Oregon Agencies	PWG Members
Alan Zelenka	Joy Aldrich, OHCS	Bob Kaplan
Hugh Arceneaux	Kelly Thomas, BCD	Chris Golightly, CRITFC
Edith Bayer	Mark Heizer, DCBS	Charity Fain, CEP
Joshua Price	Sam Henstell, OHA	Christina Zamora, KLCAS
Jessica Reichers		Claire Prihoda, Climate Solutions
Rob Del Mar		David Heslam, Earth Advantage
Ruchi Sadhir		Elijah Cetas, CRITFC
Stacey Heuberger		Jake Wise, PGE
Stephanie Kruse		Kelly Dundon, NW Natural
Amanda Welch		Ken Morgan, Gensco
Jason Sierman		Laney Ralph, NW Natural
Jennifer Villanueva		Maddy Salzman, Earth Advantage
		Mary Moerlins, NW Natural
		Nick Cheke, CEP

		Pat DeLaquil, MCAT
		Patrick Sterns, OSSIA
		Paul Hawkins, City of Portland Bureau of Planning and Sustainability
		Ryan Perry, Oregon People's Utility District Association
		Ryan Tran, CUB
		Spencer Moersfelder, Energy Trust

Introduction

- Rob Del Mar (ODOE) opened the meeting and welcomed members.
- Ruchi Sadhir (ODOE) went over ODOE's mission and how it informs ODOE's approach to the Energy Strategy.
- Ruchi explained WebEx functionality and invited non-participant attendees to submit comments through the public portal. https://odoe.powerappsportals.us/en-US/energy-strategy/
- Ruchi explained that ODOE will be relying on a Miro board to facilitate brainstorming exercises.
- Ruchi invited PWG members to introduce themselves in the chat and to speak to one policy area they're hoping to discuss in the process.
- Ruchi expressed appreciation for PWG introductions and went over the group agreements for the PWG.
- Ruchi reviewed the meeting objectives today as identifying barriers relevant to the topics identified and modeled pathways and that the modeled pathways provide one source of information that is to inform the PWG process together with PWG member input. Ruchi explaining that the collective expertise and experience of the PWG will be invaluable to informing Energy Strategy key considerations, including cost, feasibility, land use and natural resource considerations, energy burden and affordability, environmental justice, energy and community energy resilience, community benefits, and economic and employment effects.
- Ruchi reiterated that the focus of this meeting will be on barriers and that solution-focused input will be added to a parking lot for future meetings.
- Ruchi explained the roles of ODOE and the PWGs. ODOE will collect and document feedback and transparently reflect what was heard in the engagement process when proposing recommendations
- Ruchi reviewed the scope of the working group and its role in the policy discussion process as focusing on buildings and customer-sited resources in the context of Oregon's energy goals. Ruchi reviewed the meeting agenda and planned brainstorming exercises and handed over back to Rob.
- Rob reviewed the other ongoing PWG efforts and explained that some PWG scopes overlap; for example, DERs include EVs, which are included in the TE PWG. Rob explained that ODOE will work to share what's coming out of other PWGs and explained that the scope of this Buildings PWG will focus on customer-sited resources.
- Rob reviewed the planned meeting process for the PWG moving forward, with meetings focusing on barriers; strategies to address barriers and policy gaps; and, finally, proposed policy actions

- Rob explained that there's a complex policy framework in Oregon relevant to this PWG work; Rob said one element of the PWG work will be to consider statutory, regulatory, and utility-led policies.
- Rob provided a list of extant, relevant policies to highlight and map these policies as a partial description of relevant policies to consider as the PWG proceeds. Rob stated that the focus of Energy Strategy recommendations will be on near-term efforts with effects directed towards 2035.

Key Buildings PWG findings:

- Rob presented key modeling findings to the PWG.
    - An elephant in the room is projected data center load growth.
    - Likewise, TE is reflected; however, Rob highlighted that TE load growth is dwarfed by data center load
    - Rob presented a graphic from a CRITFC report; Rob describes that data center load demand largely comes from servers, which would be difficult to address in this PWG. However, elements such as HVAC loads are relevant to this PWG from a BE and EE perspective.
        - *Chris Golightly from CRITFC posted: Data Center Builidng Systems Efficiency Report that was mentioned can be found here: https://critfc.org/wp-content/uploads/2025/03/data-center-report.pdf*
- Rob reviewed the future electricity load chart, highlighting residential and commercial buildings as within scope of the PWG
- Rob presented pathways, scenarios examined by the modeling. Highlighted that the modeling found delays in EE and BE to impose costs of about $17 billion, economywide. Rob explains that ODOE will be releasing an energy wallet study to examine representative consumer impacts related to these economy-wide findings
- Rob showed modeled heat pump sales figures, stating that these sales drive efficiencies and cost-savings in the model
- Stephanie Kruse (ODOE) framed up a discussion on residential and small commercial modeling findings, stating that large commercial and industrial findings would be discussed later in the meeting.
    - Stephanie spoke to comprehensive weatherization efforts in the state as being relatively slow because these efforts are costly, saying these were included in the model. Stephanie also stated that utility weatherization programs would be likely to effect some houses as well, based on NWPCC research.
    - Stephanie stated that weatherization also provides co-benefits relative to building out additional generation resources.
    - Stephanie described data projections on heatpump sales and stock shares based on BPA research; explains that dual-fuel technologies are projected to contribute meaningfully to this number. Stephanie described that we are on pace to meet heat pump sales goals based on this data.
    - *from Bob Kaplan to everyone: 9:34 AM: Do you have separate analysis for owner occupied vs rental units?*

        - Stephanie; ODOE doesn't currently have more detailed data on rental unit heatpump sales vs owner-operator; explains that ODOE should be producing more granular data on this issue towards September
    - *from Bob Kaplan to everyone: 9:38 AM :Do you have info on total residential building stock owner-occupied vs rental?*
    - *David Heslam: thinks 64% owner occupied is likely*
        - Stephanie: will review

White Board and Miro

- Ruchi provided a few notes and instructions on how best to use Miro, especially on how to navigate the screen and draft stickynotes. Ruchi walked the PWG through navigating Miro and offered to transcribe PWG's notes from the chat window to screen, as need be.

Whiteboard Exercise 1: What are barriers to maximizing BE and EE benefits in residential and small commercial settings

- Stephanie invited PWG members to speak to noted barriers during the brainstorming exercise
- Charity Fain; renters often cannot make choices for their buildings or BE/EE upgrades. Large rental property owners' finance models don't always account for BE/EE savings as we would
- Rob reflects that, from public forums, respondents reflected hearing deterrence from contractors on installing heat pumps in their homes
- Stephanie reflects seeing barriers related to high maintenance costs and that incentives often only address installation, rather than upkeep costs
- Electricity grid constraints; Ruchi asked if PWG members could expand on these items.
    - Kelly Thomas, BCD: the ability of the grid the handle the load. Full electrification would impose expensive grid upgrades. Stephanie reflects transformer upgrade costs for neighborhoods increasing electrficiation; says this challenge, and who bears costs, occurs at both local and larger scales
    - Pat DeLaquil; emphasizes there are different layers to electrification; however, the modeling shows that increase in electricity demand is manageable. Thinks its unrealistic to overexaggerate the scale of transition and challenges.
    - Rob expresses appreciation and says ODOE has been looking at distribution system upgrades for heat pumps and EVs, ODOE looks at IRPs of utilities as increasing from 1-2% to 4-5% that would need service transformer upgrade. So, it's not nothing but not huge; and, in some cases, this reflects aging infrastructure that would need to be replaced anyway.
    - Pat states that local issues should be emphasized in the Strategy and that EV charging should be managed to fill in gaps; shouldn't drive, increase peak loads dramatically
        - Ryan Perry, Tillamook PUC, agrees 100% with Pat; for instance, Amazon EV fleet planning to charge at night is not an issue for Ryan
- David Heslam, regarding behavior and reflecting consumer preference and cost allocation
    - Thinks it's more an issue of people not "believing" that these investments will improve value of property; says, increasing home value is largely a behavioral priority.
    - David wants to share that, as a former remodeler, tracking remodeling value report/survey of real estate agents; David says this survey shows that switching to high-

performance heat pump systems is the most valuable thing and that value is almost entirely offset by installation costs. Market is willing to pay more for resale of heat pumps than for other renovations. David wanted to emphasize that market data
    - David; lack of understanding from folks as to what changes are practicable; can promote literacy
        - Charity Fain totally agrees on value of upfront education and that being underprovided now.
    - So, David says the barrier here is belief and understanding
    - David highlights policies in Portland City of Bend, Milwaukee, Hillsborough for disclosures of energy expenditures with home sales
- Stephanie sees effective control strategies for dual-fuel systems is also a barrier;
    - Clara; what do you mean by effective control strategy?
    - Stephanie; a communication system between two pieces of equipment and when/why a house would switch between a fuel and electric heatpump. It's not straightforward currently; possible, but is a wrinkle
- Elijah Cetas; regarding low-income folks and rentals. Thinks responsibility for EE, improvements should be placed on landlords rather than renters. Adds that zero-cost programs are needed for where owners don't have fee simple title and to incentivize folks having healthy homes. Need to emphasize equity and EJ issues that come with weatherization and heat pumps
    - Mark Heizer gives thumbs up response
    - In wildfires, having a heat-pump and weatherized home is very beneficial to quality of life; also beneficial during heatwaves
    - *from Christina Zamora to everyone: 10:13 AM ++Elijah*
    - *from Nick Cheke CEP to everyone: 10:13 AM Agreed, Elijah.*
    - *from Charity Fain to everyone: 10:14 AM Agreed, on all these points, Elijah.*
    - Bob Kaplan agrees on benefits; says, in Ashland, where they have a municipal utility, they have incentives to electrify. They've provided incentives to landlords in large multifamily units to install more efficient units, switching packaged terminal air conditioners for package terminal heat pumps, like the units seen in hotels
        - Thinks different policies are needed for renters, owners, and renters in large complexes vs small rental buildings
        - Also thinks new buildings vs existing buildings need different policies; Ashland imposed a fee on carbon intensive buildings, based on SCC for new carbon appliances. Says their gas utility threatened a lawsuit, but new buildings need to be addressed to incentivize new, efficient systems; sometimes, builders want to build inefficiently and then replace systems at great cost
- Mark Heizer, incentivizing for existing homes; when considering transition to heat pumps, can we provide on-bill incentives. Says, incentives that show on tax rebates are less promising, so, from a consumer standpoint, coordinating with banks or other approaches to provide on-bill incentives would be promising
- Pat DeLaquil agrees the biggest barrier to improvements is upfront cost; financial approaches could help facilitate consumer transitions
- Limited enforcement; Stephanie asks if a PWG member can elaborate? No response

Topic 2: Large commercial and industrial BE and EE

- 10:22; Stephanie presented on modeling findings.
- Large commercial:
- Large commercial buildings account for less than 15 % of buildings by number, but more than 50 percent when looking at floor area by square footage, and then around 50 percent when you're thinking about energy use and emissions of the residential sector. Commercial energy uses are diverse, and in Oregon commercial buildings use more natural gas than electric heat, which can make the electrification proposition challenging. High energy-use buildings in this sector include hospitals, restaurants, and groceries.
- There can be technical challenges to replacing HVAC systems with heatpumps, especially for systems designed to run at higher operating temperatures with the boiler output. Can require high retrofit costs.
- Industrial:
    - About half the energy used in the industrial sector is either electricity or wooden waste energy. Many facilities are using combined heating power to efficiently manage their energy usage. The other half of the energy used in this industrial sector comes from combusting fuels
    - Industrial buildings are spread across the state, with some near city-centers and some in more rural areas

Whiteboard Exercise 2: What are barriers to maximizing BE and EE benefits in large commercial and industrial settings

- Ryan Perry; simple payback for PUDs and COUs are difficult because its only 6-7 cents per kWh; so, as costs increase, incentives for EE will increase. However, another angle to this is that investing in EE now can forestall needs to install more expensive electricity generation
- Stephanie notes that ownership+occupation rates of large commercial buildings are probably higher than for small commercial buildings, but still don't account for all large commercial buildings
- Stephanie; regarding hard-to-electrify processes; are they policy barriers that should be highlighted?
- Ruchi opened the conversation at 10:33, asking if anyone had stickies they wanted to speak to
- Ruchi; stickies on differing needs among different industries, with some processes difficult or impossible to electrify.
- Mary Moerlins:
    - Are there policy gaps to serving hard to electrify areas? Yes; no policy instruments incentivize low- and no-carbon fuels in stationary industrial settings
- Bob Kaplan:
    - Comments on cost barriers to residences applies even more forcefully/a fortiori to industrial setting
- Comprehensive retrofit codes:
    - Spencer Moersfelder; this refers to cases where customers decide to do extensive upgrades, this can kick in new building/construction codes and make those upgrades costly/impose additional costs. How should these retrofits be addressed, supported?
    - *from Ryan Perry to everyone: 10:38 AM: Spot-on, Spencer*

- Spencer; buildings built around existing systems, making upgrades difficult. One case is big, old boilers in industry that require deconstruction, moving, and replacement. Can have massive costs and the useful remaining life of the boiler can be minimal, so replacement savings are less than if building could claim the upgrade as an existing condition replacement; in these circumstances, the cost-effectiveness of the project may be higher, but the upfront costs will also be higher.
- Stephanie: interesting to consider industry and uses that will require backup/making sure downtime is minimal, especially for industries and circumstances like hospitals
- Spencer: wants to second that some industrial end-uses, high-heat loads cannot be electrified and policy should account for these circumstances…
- Pat: wants to push back, thinks there's need for R&D need for steel and cement production, where electrolysis could be used and lead to reduced-cost processes compared with a CCS option; so, technology updates on the process-side will be valuable.
- Claire Prihoda; important not to see processes without alternatives now as barriers to processes where alternatives are currently available

Break, 10:50-11:00

Topic 3: Customer sited DERs, Rooftop Solar

- Rob presented on takeways on solar production in a national context
    - Solar is the median U.S. state in terms of installed capacity; Rob showed a chart showing utility-scale solar installations increasing along with some increases in rooftop residential and commercial DERs. Rob says, for purposes of our modeling, DERs were rooftop solar, batteries, and EVs, but for our policy discussions the definition may be broader
    - Rob presented on regional DER installations, stating that Idaho is starting to ramp-up solar installation, with California and Texas leading. Nevada also has expansive utility-scale solar, and North Carolina also has a large solar capacity, with about 10GW of total capacity
    - Rob says the model shows Oregon would need about 10GW of solar to meet goals; Oregon would need to do what NC has already done, in terms of total installed capacity. Rob states that this is a readily achievable goal, and would reflect about 1/5 the capacity built by California
    - Rob explains that a GW of rooftop solar in Western Oregon replaces about half a GW of that in Eastern Oregon; this follows because Eastern Oregon has higher capacity factors, but western Oregon rooftop solar would alleviate land-use requirements for siting and transmission. Rob adds that rooftop solar in Western Oregon also provides resilience benefits that are difficult to quantify
    - *from Bob Kaplan to everyone: 11:08 AM: Do you know NC's split between utility scale and rooftop?*
        - Rob doesn't know offhand; knows NC has a lot of utility-scale solar on farmland
    - *from Claire Prihoda to everyone: 11:08 AM: Does the added $7.5B in the DER scenario account for savings in transmission cost/need?*
        - The model did account for this savings and relied on a proxy cost for T&D costs

    - Patrick Sterns; on cost of rooftop solar, that reflects cost to installer vs cost to state, right?
        - Rob; says yes. The model accounts for economy-wide costs instead of state government costs.
        - Patrick; do transmission costs reflect distribution?
            - Rob; yes; distribution costs are included in the model, similarly based on a proxy cost
- Customer-sited DERs value and costs
    - Rob explains that DER siting can necessitate some distribution costs for things like improved transformers.
    - Rob says some parts of rural Oregon without gas infrastructure are better-suited for electrification because of stronger electrical infrastructure and cadet-heater reliance. In rural areas, a single transformer may serve a single home.
    - Issue of system-improvement policy arises because, in some cases, the property-owner who triggers a need for infrastructure improvements incurs all of the costs of doing so themselves; this may lead to inequitable cost distributions, as the resulting infrastructure improvements can allow neighbors to adopt EVs or otherwise benefit
    - Rob adds that there's an equity element regarding the age of housing stock and the building and electricity system improvements that might be needed to support electrification or DER placement
    - Bob Kaplan; local, community-scale solar as an alternative to rooftop and grid-scale solar. How does it fit?
        - Rob; SEIA data accounts for community solar projects. Current discussion is all behind-the-meter solar

Whiteboard Activity 3: DERs

- Rob wants to emphasize that we will be focusing on DER in this activity and focusing on DR in the subsequent brainstorming activity
- Patrick Sterns
    - Says OSSIA has introduced legislation to proactively address sales practices and consumer protections
- Rob; there are many bills proposed on net metering this year
    - HB 2656 proposes to eliminate the 0.5% net aggregate cap on on net metering for IOUs or for any utility to have to offer net metering. And so we're seeing a bill to eliminate that aggregate capacity cap.
    - SB 217; essentially eliminate the monthly net metering policy that we have in Oregon right now and allow for surplus to be carried forward in favor of monthly payments that avoided costs
- Rob reflects cost issue for rooftop solar and batteries
    - Rob says batteries make solar more valuable to utilities but are expensive
- Lack of utilities to capture the full benefits of DER systems; value proposition is solely based on changes to electric bill, but other benefits, such as DR, aren't reflected
- Ruchi asks if utilities have a perspective/if folks can explain barriers related to utilities
- Rob; reflects seeing physical constraints to rooftop siting, especially on manufactured homes

- Bob Kaplan says solar on his roof faces a payback of about 15 years; for him, it appears to be more economical to use an EV for storage. Payback is quicker in places like New York
    - Patrick Sterns agrees; says payback period is a function of inexpensive hydro.
    - Patrick; having a framework for a virtual powerplant would be valuable; need to provide benefits beyond offsetting electricity bills because of electricity costs. Having an inclusive, technology-agnostic program would be great; there are few solar companies these days, and more companies that provide a suite of generation, storage, and efficiency services and installations.
    - Rob agrees other states have more expansive programs for DR and arbitrage.

Topic 4: Demand Response

- Rob presents on Demand Response modeling findings as showing that expanding DR resources – especially in the form of vehicle-batteries and non-stationary batteries - leads to system-wide savings.
- Rob presented charts illustrating peak demands in Oregon and PGE DR efforts' role in abating peak demand Portland, as well as Pacific Power data showing DR as a percentage of installed capacity.

Whiteboard Activity 3: DR

- Rob says it's good to see focus on things like smart thermostats and water-heating timing as significant contributors
- Stephanie highlights that this category is not just for residential DR
- Rob reflects notes on utility designs and programs; states this reflects earlier point that utility-driven programs are the primary source of policies for DR.
- Elijah Cetas references LBNL studies on the grid and wildlife benefits from DR; says CRITFC appreciated seeing peak demand reductions from DR programs.
- Ruchi reflects seeing stickies around customer participation, education, buy-in. Also sees stickies on undervalued, under-quantified DR benefits
- Rob reflects seeing lack of incentives for smart appliances; says state policies and utility programs could overlap here. Providing for installation of these DR-ready appliances now could be beneficial
- Rob asks if building code speaks to these?
    - Stephanie: there's a water heater DR requirement in appliance standards; code includes solar-ready requirement
- Ken Morgan, regarding "space heating demand response plus a commission system could be a very impactful program"
    - Heat pumps are often misused and installing new thermostats could help better control/manage heat pump usage
    - Mary Moerlins: joint or full energy system planning could help manage use of dual-fuel heat systems
    - Kelly Dundon; NW Natural has a pilot project in Vancouver actually to address load balancing for gas and electricity between the utilities and having control over dual fuel systems in homes

- Elijah Cetas: reflects hearing about shut-off provisions for aluminum companies that, historically, would shut off power to industrial uses during emergency demand events; reflects that a similar approach could be valuable with respect to data centers
    - Rob; this is a sensitive subject; data centers are hesitant to accept those types of conditions because emergency operations go through them and data centers can be considered critical infrastructure
    - Mark: data centers have backup generators which may account for emergency needs
    - Mary: there's existing rate incentives for large customers to opt in to be interruptible, and there's opportunity to increased knowledge about this
- Mark: mentions that there is ongoing consideration for including DR as a voting member for the Building Codes 90.1 committee

Closing and Next Steps

- Rob stated that PWG members with question on the modeling could attend Office Hours planned for March 11. Rob and Ruchi thanked PWG members for their participation and adjourned the meeting.

Virtual Meeting Chat

from Ruchi Sadhir she/her - OR Dept of Energy to all panelists: 8:17 AM

reminder to put your TEAMS on do not disturb

from Ruchi Sadhir she/her - OR Dept of Energy to all panelists: 8:17 AM

especially Rob, Steph, and me

from Hugh Arceneaux, ODOE to everyone: 9:05 AM

https://odoe.powerappsportals.us/en-US/energy-strategy/

from Josh Price, ODOE to all panelists: 9:06 AM

https://miro.com/app/board/uXjVIWxdww4=/?share_link_id=517599019003

from Josh Price, ODOE to all panelists: 9:06 AM

I also sent all panelist an email with an quick link

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 9:07 AM

Name

Affiliation

What is one policy area you're hoping to discuss in this group?

from Ken Morgan to everyone: 9:07 AM

Ken Morgan

from Stephanie Kruse ODOE to everyone: 9:08 AM

Stephanie Kruse, She/her, Facilities Engineer with Oregon Department of Energy, energy efficiency in builidngs

from Charity Fain to everyone: 9:08 AM

Charity Fain, CEP, EJ considerations with building electrification

from Kelly Thomas - BCD to everyone: 9:08 AM

Kelly Thomas, BCD. EE in Buildings

from Mary Moerlins She, Her NW Natural to everyone: 9:08 AM

Mary Moerlins, NW Natural. Building Efficiency Opportunities

from Bob Kaplan to everyone: 9:08 AM

Bob Kaplan, Councilor, City of Ashland. Accelerating electrification/efficiency of existing buildings

from Maddy Salzman to everyone: 9:08 AM

Maddy Salzman, Earth Advantage. I am hoping we can discuss spurring market motivation for homeowners, including landlords

from Pat DeLaquil to everyone: 9:08 AM

Pat DeLaquil, Mobilizing Climate Action Together, Building electrification and DERs

from Ryan Tran - CUB to everyone: 9:08 AM

Ryan Tran, CUB, EE

from Paul Hawkins, he/him to everyone: 9:08 AM

Paul Hawkins, he/him, City of Portland. looking forward to talking more about building electrification

from Christina Zamora to everyone: 9:08 AM

Christina Zamora, Klamath and Lake Community Action Partnership, energy efficiency in residential buildings- accessible to renters and homeowners

from Kellye Dundon to everyone: 9:08 AM

Kellye Dundon, She/her, NW Natural, affordability & resiliency

from Nick Cheke CEP to everyone: 9:09 AM

Nick Cheke at Community Energy Project. Interested in building electrification.

from Claire Prihoda to everyone: 9:09 AM

Claire Prihoda (she/her) Climate Solutions. targeted electrification + efficiency

from Mark Heizer to everyone: 9:09 AM

Mark Heizer, Building Codes Division. Programs and policies that complement the energy code.

from Laney Ralph she/her to everyone: 9:09 AM

Laney Ralph (she/her), NW Natural, most interested in energy efficiency

from David Heslam to everyone: 9:09 AM

David Heslam, Earth Advantage, decarbonization including what that means regarding embodied carbon

from Ryan Perry to everyone: 9:10 AM

Ryan Perry, Tilamook PUD (representing Oregon Public Utility Districts Association), EE in general

from Kelly Thomas - BCD to everyone: 9:10 AM

To clarify: EE in Buildings, a Triple Bottom Line Approach.

from Sam Henstell she/her to everyone: 9:11 AM

Sam Henstell (she/her), Oregon Health Authority, health impacts (indoor air quality, etc.) related to electrification and energy efficient buildings

from Ken Morgan to everyone: 9:11 AM

Ken Morgan, he/him - Program Specialist at Gensco. Looking forward to discussing the deployment of HE programs for existing buildings.

from Elijah Cetas to everyone: 9:12 AM

Elijah Cetas, Columbia River Inter-tribal Fish Commission, EE and benefits to the columbia river hydropower system

from Spencer Moersfelder to everyone: 9:14 AM

Spencer Moersfelder, he/him, Energy Trust of Oregon, Energy Efficiency in Building

from Bob Kaplan to everyone: 9:27 AM

Would you please share a link to the report?

from Chris Golightlyshe/her, CRITFC to everyone: 9:27 AM

I'm just switching from my phone and will paste a link to the report here in a moment

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 9:28 AM

Thanks Chris!

from Chris Golightly, she/her, CRITFC to everyone: 9:31 AM

Data Center Builidng Systems Efficiency Report that was mentioned can be found here: https://critfc.org/wp-content/uploads/2025/03/data-center-report.pdf

from Chris Golightly, she/her, CRITFC to everyone: 9:33 AM

And since I was on my phone, I didn't introduce myself: Chris Golightly, Policy Analyst at the Columbia River Inter-Tribal Fish Commission, and I'm interested in how this information on data centers can be considered in the OSES

from Elijah Cetas to everyone: 9:33 AM

Here's a link to some of the highlights of the study as well: https://critfc.org/documents/energy-water-use-impacts-of-building-system-design-for-data-centers/

from Bob Kaplan to everyone: 9:34 AM

Do you have separate analysis for owner occupied vs rental units?

from David Heslam to everyone: 9:37 AM

Is this just heat pumps for HVAC? Or are HPWHs included?

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 9:38 AM

Thanks for the question David! I heard Steph's answer that HPWHs aren't here.

from Bob Kaplan to everyone: 9:38 AM

Do you have info on total residential building stock owner-occupied vs rental?

from David Heslam to everyone: 9:39 AM

I think that is flipped. It's likely 64% owner occupied

from Josh Price, ODOE to all panelists: 9:40 AM

https://miro.com/app/board/uXjVIWxdww4=/?share_link_id=244385959181

from Bob Kaplan to everyone: 9:40 AM

What about iMac mouse that doesn't have a right click?

from Spencer Moersfelder to everyone: 9:41 AM

Is there a way to hide cursors?

from Josh Price, ODOE to everyone: 9:41 AM

No

from Spencer Moersfelder to everyone: 9:42 AM

Copy. Thanks.

from Stephanie Kruse ODOE to everyone: 9:42 AM

You are correct David - I had that flipped. 63% owner occupied in Oregon

from Hugh Arceneaux, ODOE to everyone: 9:43 AM

You can go to dot-bar towards top-left of the window and select "View" options to toggle collaborator cursor view

from Spencer Moersfelder to everyone: 9:46 AM

Hide cursors:

from Spencer Moersfelder to everyone: 9:46 AM

1. Go to three dots in menu 2. Access view menu 3. Toggle collaborators cursors off

from Hugh Arceneaux, ODOE to everyone: 9:48 AM

Thanks Spencer!

from Charity Fain to everyone: 9:51 AM

I couldnt figure out the thumbs up. :)

from Bob Kaplan to everyone: 9:53 AM

I couldn't figure out the thumbs up either

from Bob Kaplan to everyone: 9:53 AM

Or how to hide the sea of arrows

from Christina Zamora to everyone: 9:54 AM

You can thumbs up if you click on the emoji icon

from Hugh Arceneaux, ODOE to everyone: 9:54 AM

Bob, for the arrows view - 1. Go to three dots in menu [towards top left of screen for me] 2. Access View menu 3. Toggle collaborators cursors off

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 9:55 AM

I think we don't know how to hide the sea of arrow. But did figure out the thumbs up/emojis. Basically click the sticky and then a tool bar pops up, which has a smiley face as one of the tools. When you click the smiley face, it gives you options for different emojis (including a thumb). So you click on the emoji you want, and it shows up on the sticky (but you can only see it if you zoom in - which was my problem earlier, I thought it wasn't working but I just wasn't zooming in).

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 10:04 AM

I saw some ideas on stickies about having more information about incentives that are available. I wanted to make sure this group knew that ODOE has been beta-testing the HIPPO (Hub for Incentive Programs & Projects in Oregon). Please take a look and let us know if you see corrections that are needed!
https://incentives.oregon.gov/

from Charity Fain to everyone: 10:04 AM

totally agree with David on this! Lack of upfront education on these technologies

from Maddy Salzman to everyone: 10:07 AM

https://emp.lbl.gov/publications/how-does-home-energy-score-affect

from Bob Kaplan to everyone: 10:07 AM

Thanks, Maddy

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 10:07 AM

Thanks Christina - I'll let the team know about that mis-match on resource type/incentive program.

from Claire Prihoda to everyone: 10:08 AM

@Stephanie can you elaborate on what you mean by effective control strategy?

from Mark Heizer to everyone: 10:09 AM

New Thermostats and furnaces can handle the controls

from Maddy Salzman to everyone: 10:09 AM

I have to hop off for part of the meeting but will be back after my conflict ends

from Charity Fain to everyone: 10:10 AM

Agree with this point from Mary.

from Sam Henstell she/her to everyone: 10:10 AM

Second Mary's point!

from Ken Morgan to everyone: 10:11 AM

Most homeowners are not trained on how to fully utilize a new HP system for max comfort and savings.

from Charity Fain to everyone: 10:11 AM

Yes, we are finding this to be a big issue. I noted that too.

from Bob Kaplan to everyone: 10:12 AM

Also on the education side, resource navigators who aren't selling anything can help

from Christina Zamora to everyone: 10:13 AM

++Elijah

from Nick Cheke CEP to everyone: 10:13 AM

Agreed, Elijah.

from Charity Fain to everyone: 10:14 AM

Agreed, on all these points, Elijah.

from Kelly Thomas - BCD to everyone: 10:17 AM

https://www.energy.gov/sites/default/files/2024-10/Congressional%20Report%20EV%20Grid%20Impacts.pdf Impact of Electric Vehicles on the Grid - Report to Congress - June 2024

from David Heslam to everyone: 10:18 AM

Here's a communications strategy suggestion to help with general population understanding of the issues. If the positive vison of the future for housing is an energy efficient, healthy, all-electric housing stock, then we should talk about modernizing our housing stock. I that terminology would also encompass the issue of addressing deferred maintenance.

from Ken Morgan to everyone: 10:18 AM

Agreed David!

from Pat DeLaquil to everyone: 10:18 AM

Nicely framed!!!

from Elijah Cetas to everyone: 10:19 AM

Great break down of different scales and strategies, Bob.

from Bob Kaplan to everyone: 10:20 AM

100% Mark! We in Ashland have had a small on-bill financing program for many years, but the term is just 5 years. We're working to expand it with 10-year financing

from Ryan Perry to everyone: 10:21 AM

A lot of utilities already offer on-bill financing

from David Heslam to everyone: 10:24 AM

I agree with Mark, for moderate income and above, financing is a key issue. We, as Americans, finance everything and it should be easier to finance these improvements. When it comes to mortgage finance, Fannie Mae and Freddie Mac already understand that asset value increase with these improvments. But, for easier to access loans that are not secured by the asset value of the home, there has rarely been a focus on this. I feel the on-bill loan with Craft3 that was used by Enhabit was successful in this area.

from Josh Price, ODOE to all panelists: 10:26 AM

https://miro.com/app/board/uXjVIWxdww4=/?share_link_id=808294341469

from David Heslam to everyone: 10:27 AM

Also, on residential finance, even though Fannie/Freddie incentivize lenders to promote EE mortgages, it raely happens because lenders don't hear from borrowers that they want this. Of course the borrowers don't knwo to ask. Chicken and egg issue.

from Bob Kaplan to everyone: 10:29 AM

thanks, Ryan! 100% our situation toot

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 10:38 AM

Thank you Spencer!

from Ryan Perry to everyone: 10:38 AM

Spot-on, Spencer

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 10:40 AM

Clearly a set of technical terms :D

from Alan Zelenka, ODOE to everyone: 10:41 AM

I have tried spit, duct tape, and gum - none work!

from Spencer Moersfelder to everyone: 10:42 AM

Not for long. Have to keep applying constantly.

from Mary Moerlins She, Her NW Natural to everyone: 10:44 AM

Yes, policies that incent all decarbonizing strategies that work for industrial energy users

from Ryan Perry to everyone: 10:48 AM

Pat- you're not wrong, however looking at it from a creating policy perspecitve, that's a dangerous approach to potentially mandate non-existant or cutting edge technologies.

from David Heslam to everyone: 10:48 AM

Not my area of expertise, but I'm agreeing with Pat, that I read about major investors worldwide that are working on low carbon alternatives to those high heat requirements process and that is why the fossil fuel requirements for those are typically the last to be removed from th societal mix between now and 2050.

from David Heslam to everyone: 10:48 AM

I agree with Claire about that framing of the issue.

from Pat DeLaquil to everyone: 11:00 AM

Back

from Nick Cheke CEP to everyone: 11:00 AM

Here

from Christina Zamora to everyone: 11:00 AM

back

from Charity Fain to everyone: 11:00 AM

back

from Sam Henstell she/her to everyone: 11:01 AM

back

from David Heslam to everyone: 11:01 AM

back

from Spencer Moersfelder to everyone: 11:01 AM

Back

from Mary Moerlins She, Her NW Natural to everyone: 11:01 AM

back

from Ken Morgan to everyone: 11:01 AM

back!

from Bob Kaplan to everyone: 11:08 AM

Do you know NC's split between utility scale and rooftop?

from Claire Prihoda to everyone: 11:08 AM

Does the added $7.5B in the DER scenario account for savings in transmission cost/need?

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 11:12 AM

Bob - here's where that NC stat came from: https://seia.org/solar-state-by-state/

from Claire Prihoda to everyone: 11:13 AM

TY!

from Mark Heizer to everyone: 11:15 AM

Is output difference in kWh/year (western vs. eastern Oregon) taken into account?

from Mark Heizer to everyone: 11:15 AM

That's output per installed kW of solar..

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 11:15 AM

Also Bob - there's a bar graph here about NC that has the breakdown on utility scale, commercial, community solar, solar - https://seia.org/wp-content/uploads/2024/12/North-Carolina.pdf

from Ryan Perry to everyone: 11:16 AM

No natural gas in Tillamook County...

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 11:16 AM

**residential solar*

from David Heslam to everyone: 11:19 AM

Our solar ambitions are low in my opinion; like much of the US. Quick online search shows that the US installed about 40 GW in 2024 (about 50% utility-scale). China installed about 330 GW (about 80% utility-scale). Chinese solar capacity is now roughly 5-times that of the US. It would be interesting to see what an even higher west-side rooftop adoption rate looks like in the analysis.

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 11:20 AM

Thanks Ryan - tracking down that issue in the map visual.

from Josh Price, ODOE to all panelists: 11:21 AM

https://miro.com/app/board/uXjVIWxdww4=/?share_link_id=480627873417

from Charity Fain to everyone: 11:34 AM

But I dont think Solar for All will cover all the costs. Even with a better amount of funding.

from Joy Aldrich OHCS, Energy Svcs to everyone: 11:35 AM

For the Solar for All program, is that front facing coverage or rebate-based? I apologize if I missed that.

from Charity Fain to everyone: 11:36 AM

CEP has put in a few rooftop solar with PCEF funds. Not enough to say much though.

from Mary Moerlins She, Her NW Natural to everyone: 11:36 AM

I have tried in all homes I've lived in in Oregon- unfortunately the beautiful trees have been a barrier

from Stephanie Kruse ODOE to everyone: 11:37 AM

I helped a friend sort out how to choose from three quotes (so glad she got multiple quotes) but once she had them she had no idea what to do with them (capacity vs cost and what is a realistic payback?)

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 11:38 AM

Hi Joy - you can find out more here https://www.oregon.gov/energy/Incentives/Pages/Solar-for-All.aspx

from Ryan Perry to everyone: 11:40 AM

Our most expensive rate (Tillamook PUD) is $0.08/kWh, makes certain improvmenets challenging to bring to fruition

from David Heslam to everyone: 11:44 AM

I'm lucky to live in a house I built in North Portland 20 years ago with rooftop solar. PGE is no running a DER pilot, SALMON, in my neighborhood. I was able to add a battery. On cold mornings PGE uses my battery to power neighbors heating systems. They do the same on hot summer afternoons. They fully charge it before those events. When the system leans a storm is coming it harges to get ready for a power outage. The rest of the time the battery stores our solar energy to flatten the demand profile that our house presents to the grid. No one else in our household even no anything is happening. Except when we still have power and the neighbrs don't.

from David Heslam to everyone: 11:45 AM

AS Rob mentioned, I don't bother trying to arbitrage rates because the TOU rates here don't offer enough of a differential for that to make sense.

from Elijah Cetas to everyone: 11:46 AM

CRITFC PSA: reducing peak demand on the hydro system = protecting salmon and treaty fisheries. DR has outstanding potential to improve resiliency and protect fish as the hydro system becomes increasingly strained due to climate change

from Bob Kaplan to everyone: 11:49 AM

Thanks, David. A friend in Vermont participated in Green Mountain Power's distributed battery program beginning almost 10 years ago

from Ken Morgan to everyone: 11:54 AM

2026 IRA HP Tax credit does point to DR controlled systems.

from Mark Heizer to everyone: 11:58 AM

Data Centers have back-up generators. They can swap when needed.

from Mary Moerlins She, Her NW Natural to everyone: 11:58 AM

There are existing rate incentives for large customers to opt in to be interruptible. opportunity to increase knowledge about this

from Mark Heizer to everyone: 11:59 AM

90.1 is actively being modified to consider demand response (as voting member of the 90.1 committee, items will be in future editions, and thus in Oregon code)

from David Heslam to everyone: 12:00 PM

Bob, I'm also "fortunate" enough to be part owner of an off-grid old logging camp with 16 buildings on a microgrid that gets used for education. We are removing a dam for fish passage, downsizng from small hydro to micro-hydro, adding solar and batteries and making everything more efficient - all while trying to maximize safe DIY efforts to minimize expense. It's an adventure that makes me feel more empathy to grid managers!

from Ruchi Sadhir she/her - OR Dept of Energy to everyone: 12:00 PM

Thanks everyone for contributing to the chat and the miro board. Really great information. We so appreciate you and your participating in this policy working group.

from Ryan Perry to everyone: 12:01 PM

Thanks everyone!

from Ken Morgan to everyone: 12:01 PM

Thank you!

Miro Whiteboard

Below is a transcription of the feedback received in the 3/5/25 Miro Whiteboarding activity. The whiteboard is also available for review at: Buildings PWG 3/5 - Miro

Whiteboard Q1

Question 1:
What are the barriers to maximizing benefits from building electrification and energy efficiency in residential and small commercial?
• Setting Goals that are too low for EE will lead to policies that are not ambitious enough • Split incentives with owner/renter (+4) • Need for full weatherization with HP installs (+2) • Lack of programs to incentivize or require landlords to adopt EE (+2) • lack of contractors to install equipment (+1) • Building owners don't BELIEVE their building will be more valuable if they invest in energy-related expenditures. • Sometimes heat pumps don't work as advertized. Those issues seem to get shared more than the success stories • Lack of information on available incentives • Equipment capital cost is cost prohibitive (+2) • Client understanding of incentives/rebates - also general clarity on incentives/rebates • Electricity prices • Lack of programs for owners of mobile homes (+2) • Upfront costs of HE residential retrofit. • Lack of information in PNW about combined furnace and HP systems • Comprehensive weatherization programs are difficult to achieve • Overly complicated demand response technology in new appliances • Deferred maintenance on buildings and cost to upgrade (2) • Fuel switching not allowed by OPUC for ETO incentives (+3) • First Costs for EE Measures & technology upgrades • Lack of ZERO cost programs for low-income people (+1) • Need for whole home weatherization funding (+2) • navigating how to access resources or knowing where to seek resources (+2) • Low-income households don't have the access to capital for improvements (+6) • Consumer choice/ preference • Many building owners lack an understanding that an older building can be made more efficient or have a lower carbon footprint. • Supply chain is limited • Trust & comunication between the CBO and client • Educate builders that electri home can cost less to build • Issues with functionality and internet capability with apps in appliances (+1) • Need a framework for VPPs • Electricity grid constraints (+3) • Heat pumps are really expensive • Too few trade allies and providers • deferred maint impacts up to 1/3 of eligible customers (+2) • Lack of education on new technology and how to effectively use after install • Equipment lifetime of HP

- Nameplate Efficiency vs. Actual Operations - Behavioral (+1)
- single above ground energy system causing resiliency issues
- Insufficient consumer finance options (+4)
- Gas lobby interference (+2)
- Affordability (+3)
- maintaining affordability for month-to-month energy expenses (+4)
- Collaboration with public health-related organizations (+1)
- Lack of state and federal funding for low-income individuals and families
- Many heat pump applications are not currently cost-effective in IOU territories
- Cross-organization administration difficulties
- Limited enforcement
- Consumer experience (heat pumps don't blow hot) (-1, +1) [comment: This is a huge one - especially for folks coming from a gas furance]
- effective control strategies for dual fuel system - tech may not be there yet.
- need to consider long term supports for low income residents in relation to building efficiency- education on how to use equipment
- ETO is fuel agnostic (+?, +2)
- Incentives are too low for actual install costs--major issue for low income
- Electric service size o existing homes
- Renters really have little options (+6)
- Oregon building codes limiting cities' action (+1)
- Decarbonizing Oregon housing likely costs more than $50B. Who pays, and why do they prioritize it?
- poor set point and operator error
- Possible workforce constraints in certain parts of the state
- From public comment: Homeowners being talked out of heat pumps by contractors
- Utility funded EE investment are subject to fuel switch constraints (+2)
- All carrots no sticks (+1, +?)
- need to address existing health and safety issues prior to EE to protect the investment and resident
- ability to provide WX services more than once as technology improves and equipment life is reached
- electric generation is not necessarily free of fossil fuels
- Quality of installations (+3)
- Lack of meaningful quality control over HVAC design/installation
- Upfront cost is unaffordable or not worth it to majority of building/home owners
- absence of state provided zero interest loans
- lack of coordination among similar programs
- Cost Prohibitive (+2)
- Lack of public education / policies on EE & weatherization benefits to health and emergency management (e.g. heat pumps + filtering wildfire smoke)
- Low focus on weatherization (only 20%) wastes a lot of energy (+2)
- economies of scale (vs. one by one projects)
- 9th Circuit ruling and current Administratiom (+1) [comment: "perhaps the biggest one"]
- Homeowners down't value these products to demand them / pay for them (+?)
- Need to pair with other home remediation activities (sealing, etc.) (+2)
- Lack of connection/tracking to health-related outcomes (asthma, indoor air quality in general, etc.) (+1)
- Electric grid mix still has a lot of coal and NG generation
- The use of the term choice as something that actually prevents ratepayers from getting incentives to make a choice to electrify

- Home electric panel upgrade needs (+2) [comment "Can be a big cost & deterrent"]

Parking Lot / Bike Rack

- Electric cost burden switch to non-EE customers
- Here's a communications strategy suggestion to help with general population understanding of the issues. If the positive vison of the future for housing is an energy efficient, healthy, all-electric housing stock, then we should talk about modernizing our housing stock. I that terminology would also encompass the issue of addressing deferred maintenance.
- On bill financing of HVAC upgrades discussed by several PWG members

Whiteboard Q2

Question 2:

What are the barriers to maximizing benefits from building energy efficiency in large commercial and industrial sectors?

- Net Metering, including virtual net metering
- Storage/DRi: coherent strategy acroos all utilities (+1)
- Robust IT/Security for DR
- Customer Buy-In / Capital Costs (+1)
- High Heat Process is energy intensive
- lack of coordination among similar programs
- All energy needs do not have electric alternatives (+1)
- Energy efficiency is not necessarily high on the list of customer priorities (+1)
- Energy costs are often a small part of overall product cost and so is not a business priority
- Need for R&D on alternative processes for hard to electrify industries
- Lack of clean options for hard to electrify industries
- Competitive Market Pressures (+1)
- low electricity prices low simple payback
- building owners may not be interested in efficiency if tenants pay utility bills
- Cooking fuel preference
- Insufficient consumer financing options
- capital cost prioritization
- Comprehensive retrofits can kick in codes associated with new construction resulting in higher baselines
- Out of state ownership, management and decision making structures can make it harder to influence customer actions
- Building may have been constructed around systems and it is very difficult to upgrade (+1)
- Issues surrounding remaining useful life of equipment and related baseline considerations
- missing policy/program/incentives around low carbon fuel use in industrial
- missing consideration of non energy non $ benefits in developing programs and incentives
- Production downtime needed for upgrades (+1)
- commercial vacancy rates
- Need for one-stop-shop for EE, virtual powerplants and DER -- utilities?
- Need for more backup energy sources (hospitals)
- lack of local need/market for byproducts or waste heat
- Grid constraints, larger loads in areas already constrained like hillsboro
- some industrial processes are theoretically impossible to electrify
- commercial gas heat pumps might be more appropriate than full electrification (+1)
- target industries which show the most promise for growth

- retrofit efficiency workforce shortages
- rural infrastructure, consistency of service challenges
- Policies for utilities to treat commercial DER / DR investments like resource investments
- Commercial building owners typically have very short term financial goals in mind
- Letting perfect be the enemy of good
- comprehensive approach to commercial/industrial EE- seems to be single, non-interactive
- Both steel and cement can be made thru electrolysis processes that have emerging demonstration projects [comment: "not the right place, this is a barrier discussion"]
- missing policies that incent all decarbonizing strategies that work for industrial energy users

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- incentivizing decarbonization - potential vehicle for this in GHG reporting programs

Whiteboard Q3

Question 3:

What are the barriers to maximizing benefits from customer sited distributed energy resources?

- PMA Contracts
- Lack of faith from utilities in non-wires solutions
- Participation incentives for households are weak in relation to the grid benefits delivered; i.e. net-metering agreements
- Owner low-income households cannot afford nor access rebates, regardless of financing (+2)
- Lack of societal understanding about the value propositions around lowering peak loads. "If I don't know it's a problem then why do I need to be part of the solution" (+2)
- Need a framework for VPPs
- Need a better process for VNEM / multifamily
- system maintenance and component useful life issues
- physical limitation - need for technology
- system sizing appropriate to building size
- Training for battery installers to increase competition. The local pricing is at the early adopter stage; $5k materials and $15k labor
- framework for managing timeline of response between DER installers and utilities
- Lack of full valuation of resiliency role of DERs
- consolidated billing / on bill financing
- Customer siting, burden on each to finance and navigate
- Deferred maintenance again. Need to upgrade electric panels and replace roofs. (+3)
- Cost to maintain panels over time are of concern to low-income homeowners for rooftop. Can be funds to pay for install but not maintenance. (+1)
- Need for education on opportunities/costs/benefits (+1)
- Lack of standardized offerings
- Need to open up business opportunities for developers to partner with schools or warehouses to use available roof space
- microgrid/community generation
- Limits to net metering that discourage exporting surplus to the grid
- Lack of utility programs to capture the avoided cost benefits of DERs
- Barrier for renters
- Cost is prohibitive for most consumers. Not a necessity.

- Too many different companies and programs, not enough utility streamlining for clarity and ease
- High cost fixed batteries
- Limited options for EV-home bi-directional charging
- The amount of homes that need weatherization/EE before installing rooftop solar. Not the best first step if you have not done the other work yet.
- Lack of quality financing mechanisms for solar plus battery installations
- impact on distribution systems during high peak times/weather- need to focus on community resilience particularly in rural areas that seem to be more prone to outages during inclement weather
- manufactured/mobile home roofs may not be suitable for rooftop solar
- Low-income programs need to pay 100% for costs, incentives are not enough. (+3)
- less opportunity to leverage economies of scale
- Consumer confusion (process, contracting, maintenance)
- Bad actors in the sales market
- Changing net-metering landscape
- ROI of rooftop solar in PNW is less than, say, sunny southwest (+2)
- Trust in door-to-door sales offers
- Utilities know best where distributed resources will have most impact. How to balance needs & incentivize
- harder to maximize output/target in the areas needed most or most ready
- How to equitably credit for "storage" (without "gaming"... ENRON V2.0)

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- On premise generation should be a complete system (Solar+battery) for grid resilience.
- Premise question: do DERs have to be customer sited? or is there a role for utilities or other entities?
- Does it make sense for utilities to take a more direct role in solar/electrification? Small companies as contractors, but utility acting as the general contractor. Should aggregating these investments be treated as a "resource" for utility cost recovery?

Whiteboard Q4

Question 4:

What are the barriers to maximizing benefits from demand response?

- Technology compatibility - Ex. thermostats
- Need to properly value the grid + environmental benefits of DR -- community resilience & salmon protections
- Limited or non-existant time of use rates
- Local resistance to smart meters
- Look at SMartDER "bring your own device" tarriff in Hawaii
- Consumers feel like "smart" technology isn't actually so smart - perceived as doing things they don't want
- pathways to integrate DER's into wholesale markets
- Lack of utility incentives for smart appliances
- DERMs systems - overall statewide system for calling events
- Maintaining connectivity of internet connected devices over time. What is the incentive to maintain that connection?
- Space heating DR + a commissioned system could be very impactful program.
- Need for more compelling incentives to participate
- Customer Buy-In
- Value prop for customers. Compensation paid to customers during event vs. keeping rates low longterm
- CEP talked to low-income homeowners on peak management. They are willing to change behavior but want to know all rate payers are doing their part and changing too. Were very happy to learn more on this topic

• LI households lack basic weatherization / tech that make DR participation safe and possible
• Issues around cyber security related to remote control of DERs in a home. My husband is a sys engineer and wont let our house be connected.
• impact on low income household service costs when they have little/no control of EE in their home
• Need for policies that incent industry specific DR opportunities
• Important to remember that DR is a resource for all energy types
• Need for industrial demand response requirements for major loads (data centers)
• Customers reluctant to allow utility to "reach" into their home(s)
• Customer concerns about loss of desired services during DR events
• Limited support for micro-gridding
• Customers weighing the buy-in of energy savings vs making behavioral changes
• challenges of behavioral change- people perceive a loss
• grid benefits are not tied to weatherization energy savings
• Limitations/ trustworthiness of reliable energy in rural OR
• Code does not currently consider the needs of a building to be grid interactive. Codes are design for building to only be consumers of energy.
• Increase knowledge about interruptible rates
• Need clear programmatic rules for equity + public engagement + communication
• utilities need to design effective but simple programs that customers can understand
• Educate the public about the fact that we need to manage the grid differently now. Let them know they have a part to play.
• Issues associated with apps in appliances for grid connectivity
• Misinformation about what can make a home resilient to power outages.
• Need for more performance-based regulation of utilities
• rate design to maximize uptake

Parking Lot / Bike Rack

• Are utilities a "natural monopoly" for DR programs, or do we benefit from decentralized programs?
• Tie incentives to DR ready systems to promote adoption.
• collaborative utility and industry DR/load management example at Cascade Steel and Mcminnville Power
• Community level DR - microgrids, virtual power plants