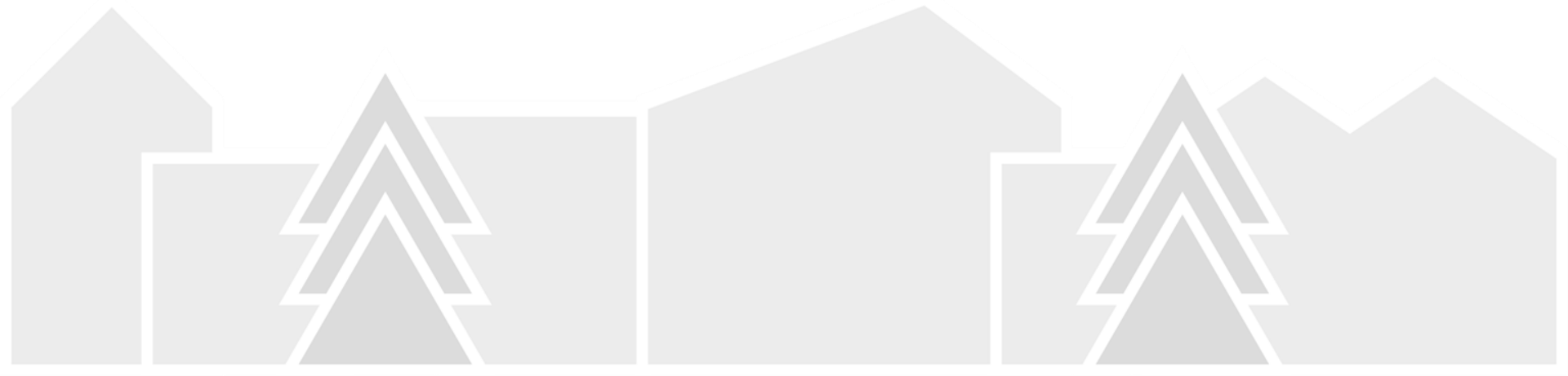


OREGON HOUSING & COMMUNITY SERVICES Multifamily Energy Program

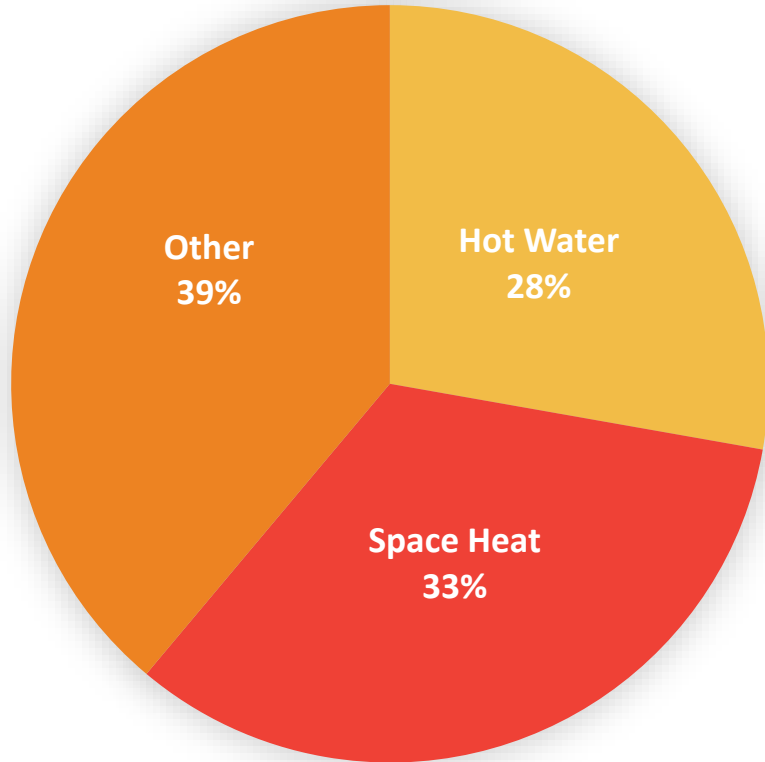
Emerging Technology Series: Drain Water Heat Recovery

Presenter: Dan Wildenhaus

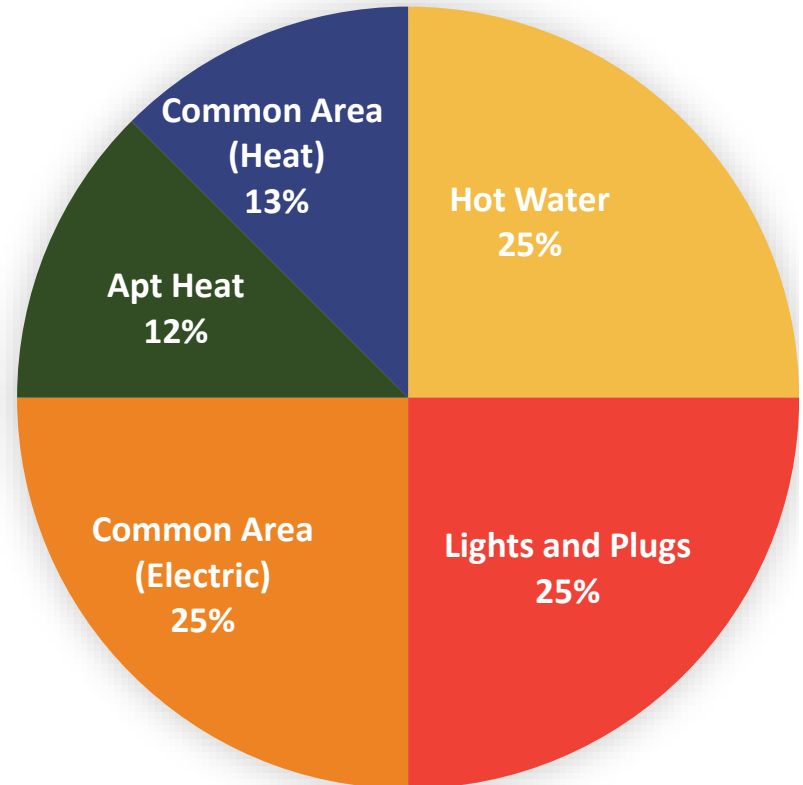


WHY FOCUS ON HOT WATER?

Low Rise



Mid-Rise



WHAT IS DRAIN WATER RECOVERY (DRAIN WATER HEAT RECOVERY OR DWHR)

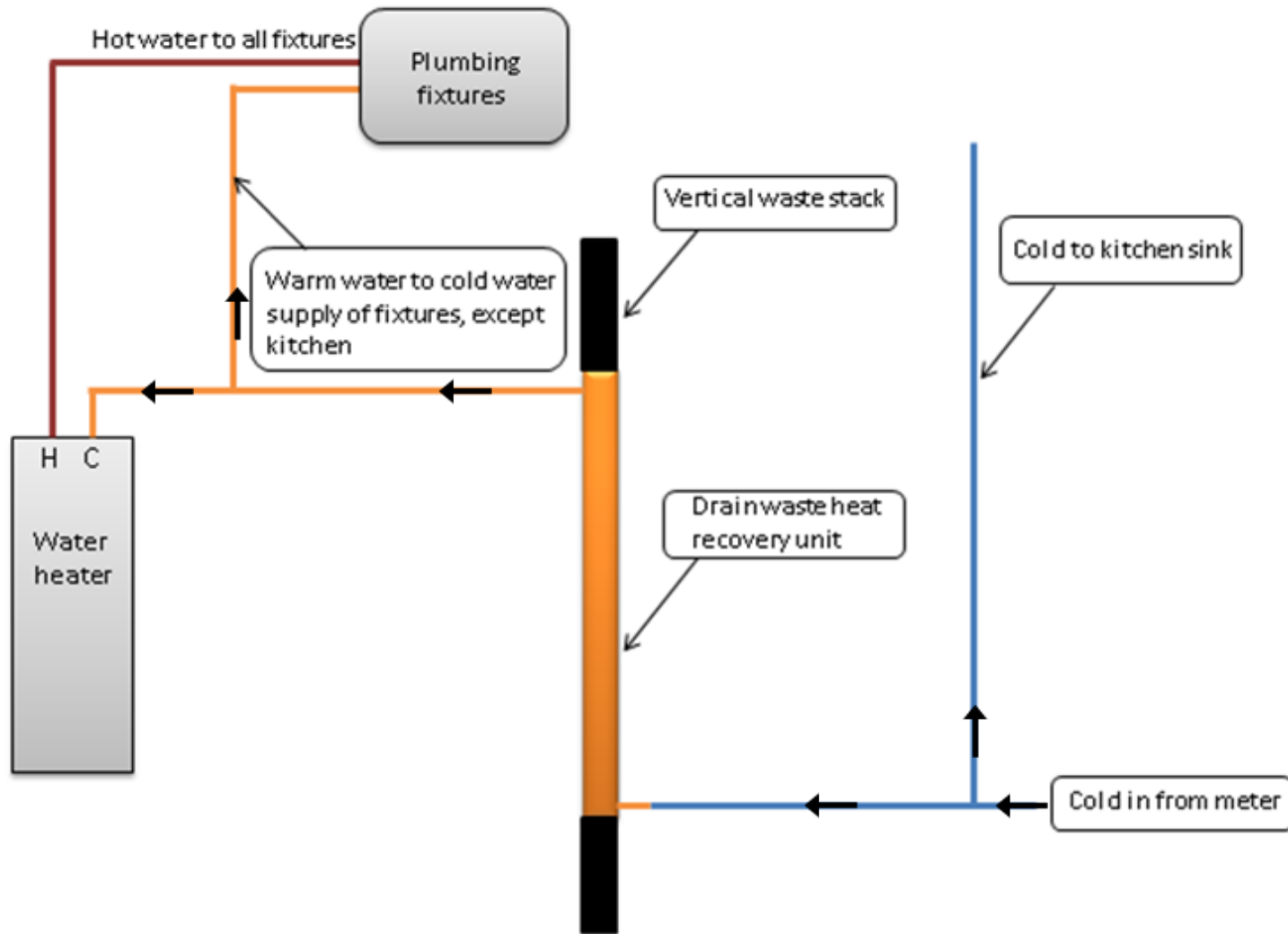


- ◆ Section of **copper drainpipe** (~3'-5') is **installed beneath a shower**, typically the largest hot water use in an apartment.
- ◆ Section of drainpipe has **smaller-diameter copper piping** (~ ½ inch diameter) **wrapped tightly around it**.
- ◆ Cold-water supply pipe connected to water heater and/or shower is diverted to flow through the small-diameter copper pipe, **recovering heat from the waste water**.

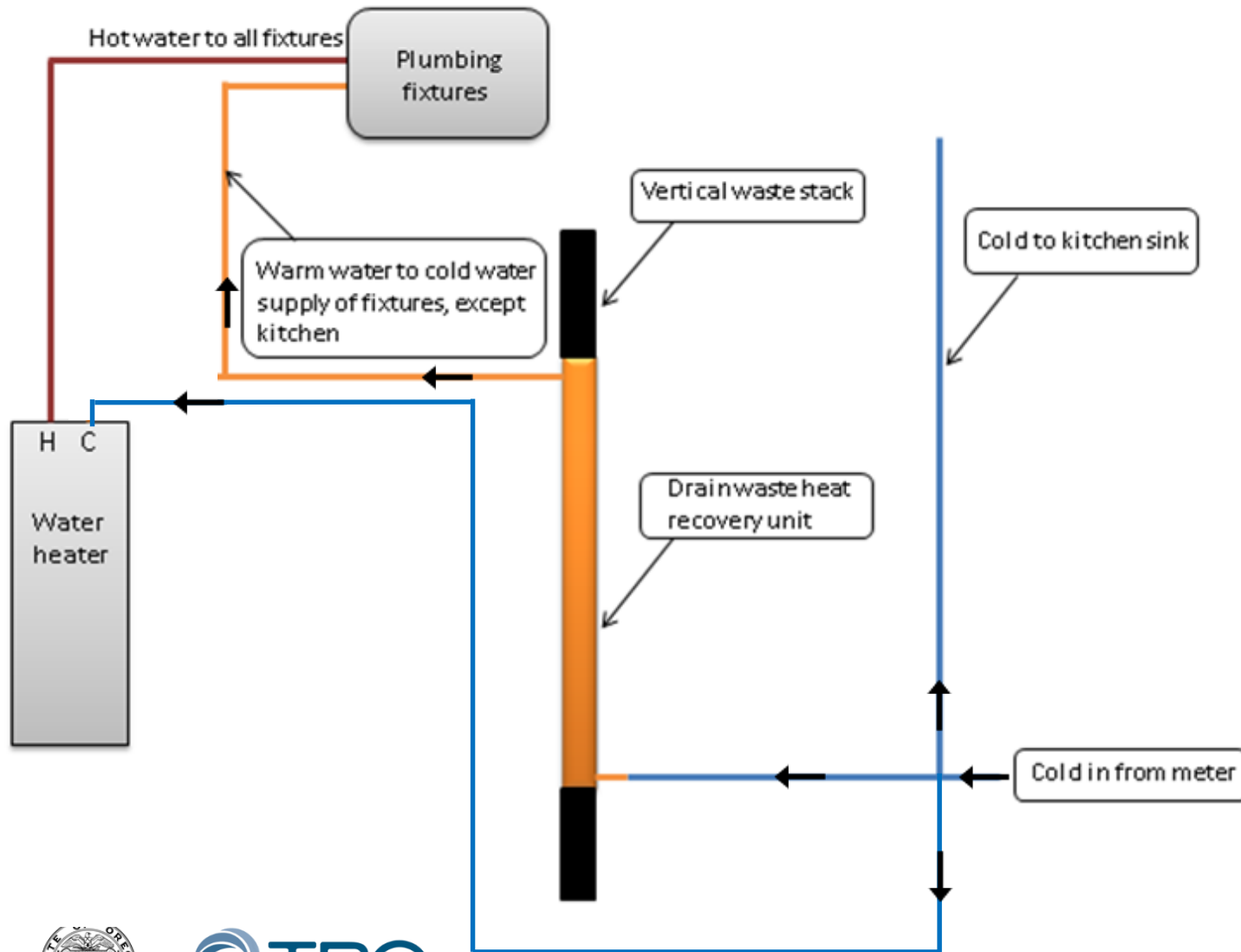
TANK VS TANKLESS OPTIONS

- ◆ **Tank systems** - When water is heated in a storage tank (HPWH, gas tank, electric standard tank), the recovered warm water from the DWHR unit can be plumbed to feed either the tank or directly to the shower. The water will move to whichever has a greater flow.
- ◆ **Tankless systems** - While the plumbing can be laid out the same way, high efficiency tankless systems perform best when the incoming water is colder. Most DWHR connected to tankless systems choose pipe directly to the shower, or require the tankless unit to be thermostatically controlled.

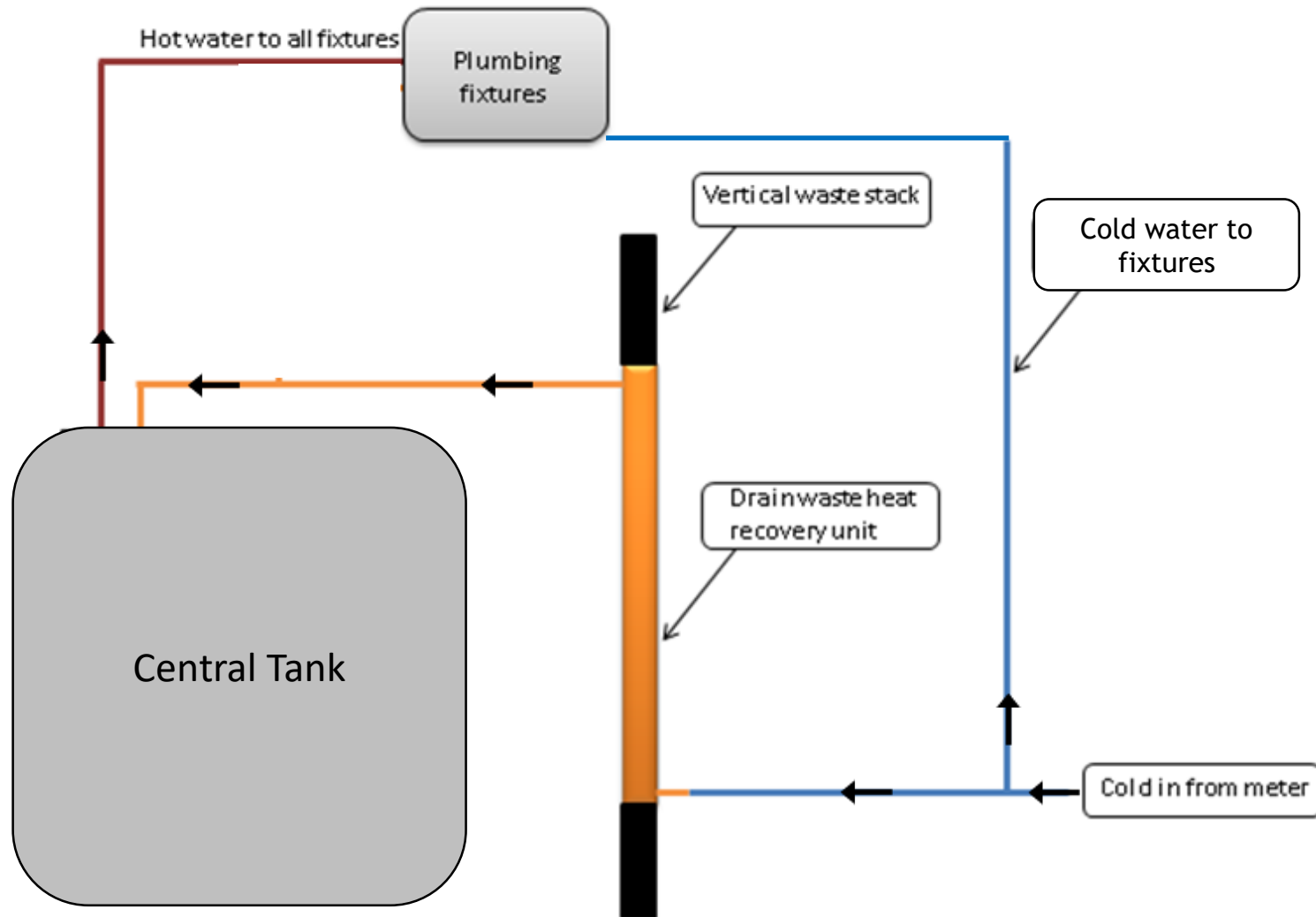
IN UNIT WATER HEATER LAYOUT



IN UNIT TANKLESS HEATER LAYOUT



CENTRAL WATER HEATER LAYOUT



DWHR FOR MULTIFAMILY

Central DHW systems have larger hot water loads, which improves savings and payback.

Larger systems benefit from economy of scale pricing.

Passive systems such as DWHR require little maintenance.

Potential to align with larger rehab event (such as basement renovations or plumbing overhauls).

NEW CONSTRUCTION VS. RETROFIT

Consideration	New Construction	Existing Buildings
Building Disruption	DWHR requires additional 4 to 6 feet of access to drain lines. This may require more space in wet walls or in a basement	Unless providing a massive retrofit to the building and plumbing layout, DWHR is only feasibly plumbed into projects with central basement systems
Energy Efficiency/Savings	DWHR systems are 30-60% efficient at capturing waste heat and can reduce energy use by 30-40% at the showerhead	DWHR systems are 30-60% efficient at capturing waste heat and can reduce energy use by 30% when plumbed to the tank
Ideal applications	In unit Heat Pump Water Heaters in high performance buildings or central water tank systems	Central water tank systems
Costs	Product and labor can be up to \$1700 per system, but fewer systems or disruptions may be needed	Product and labor can be up to \$1700 per system install, plus an additional \$1,000-\$2,000 plumbing retrofit

INFLUENCE ON OR-MEP INCENTIVES

Tier	Savings Threshold	Incentive
Tier 1	≥ 20% kWh savings compared to baseline*	\$0.80 / kWh saved
Tier 2	≥ 25% kWh savings compared to baseline*	\$0.90 / kWh saved
Tier 3	≥ 30% kWh savings compared to baseline*	\$1.00 / kWh saved

**baseline is code in New Construction and existing conditions for retrofits*

Incentives for Whole Building Path calculated as follows:

[% Savings Incentive Tier Rate (\$/kWh)] X [Total kWh Modeled Savings]

THANK YOU FOR ATTENDING

**Oregon Housing and Community
Services Multifamily Energy Program**

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