

OREGON HOUSING & COMMUNITY SERVICES Multifamily Energy Program

EMERGING TECHNOLOGIES, HEAT RECOVERY VENTILATION

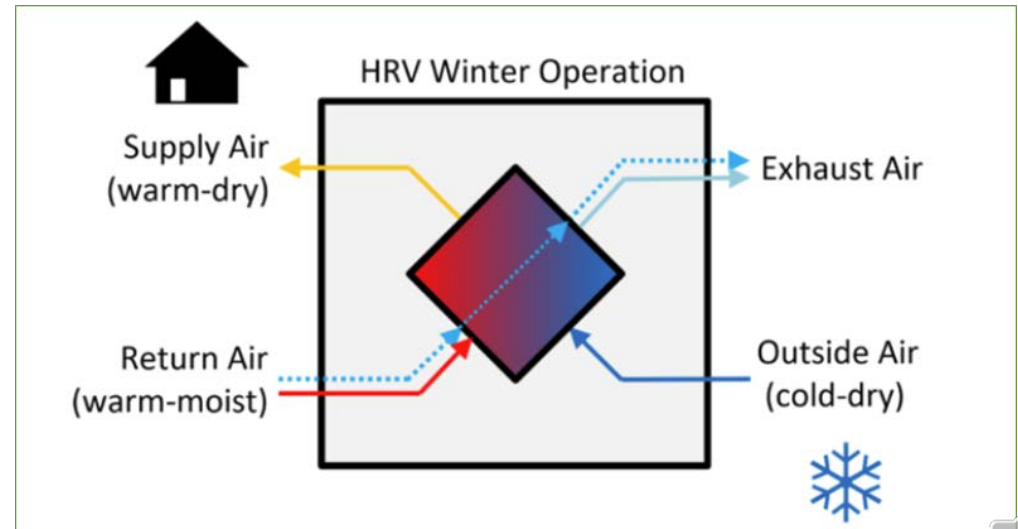
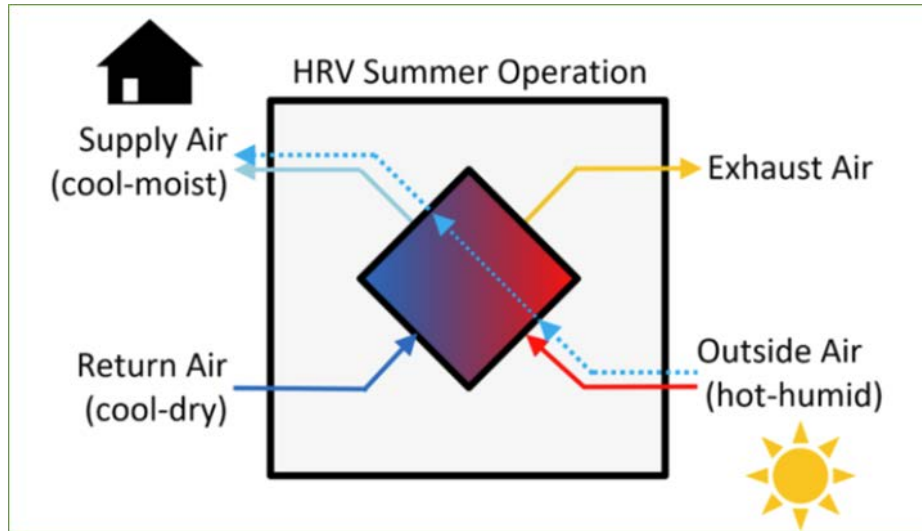
Presenter: Dan Wildenhaus



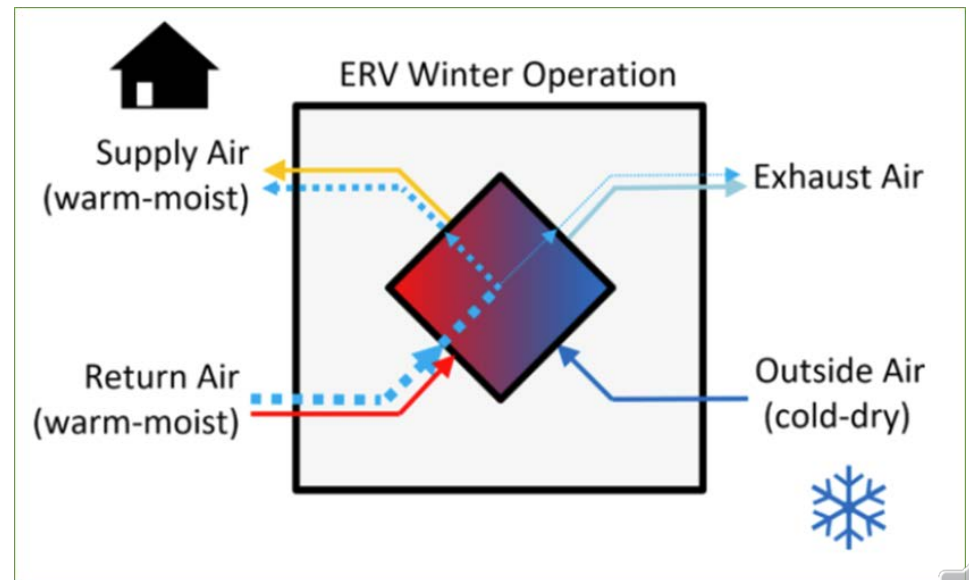
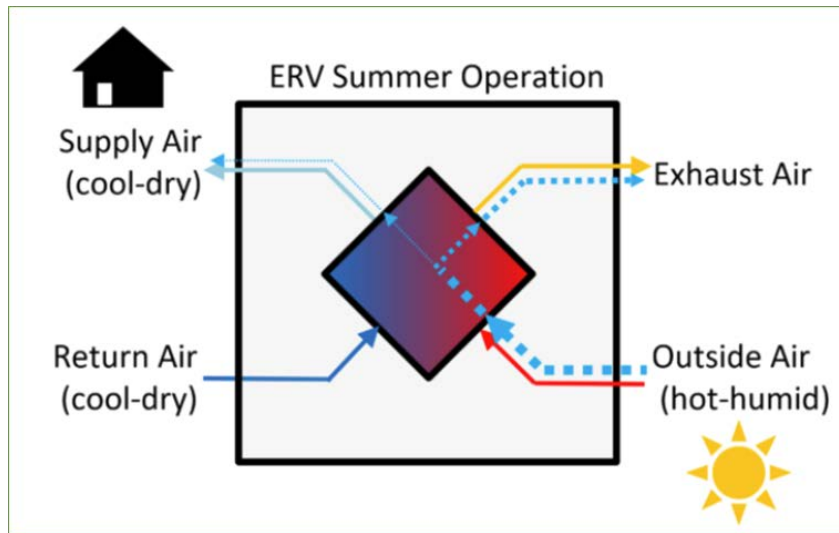
WHAT IS HRV AND ERV?

- ◆ **Heat Recovery Ventilation (HRV)** is a **balanced mechanical ventilation system** that simultaneously **supplies and exhausts equal quantities of air** to and from a house while transferring heat between the two air streams.
- ◆ **Energy Recovery Ventilation (ERV)** works in a **similar way but transfers some of the moisture** from the outgoing airstream into the incoming air, so it keeps the humidity in your home at a constant level.

HEAT RECOVERY VENTILATION



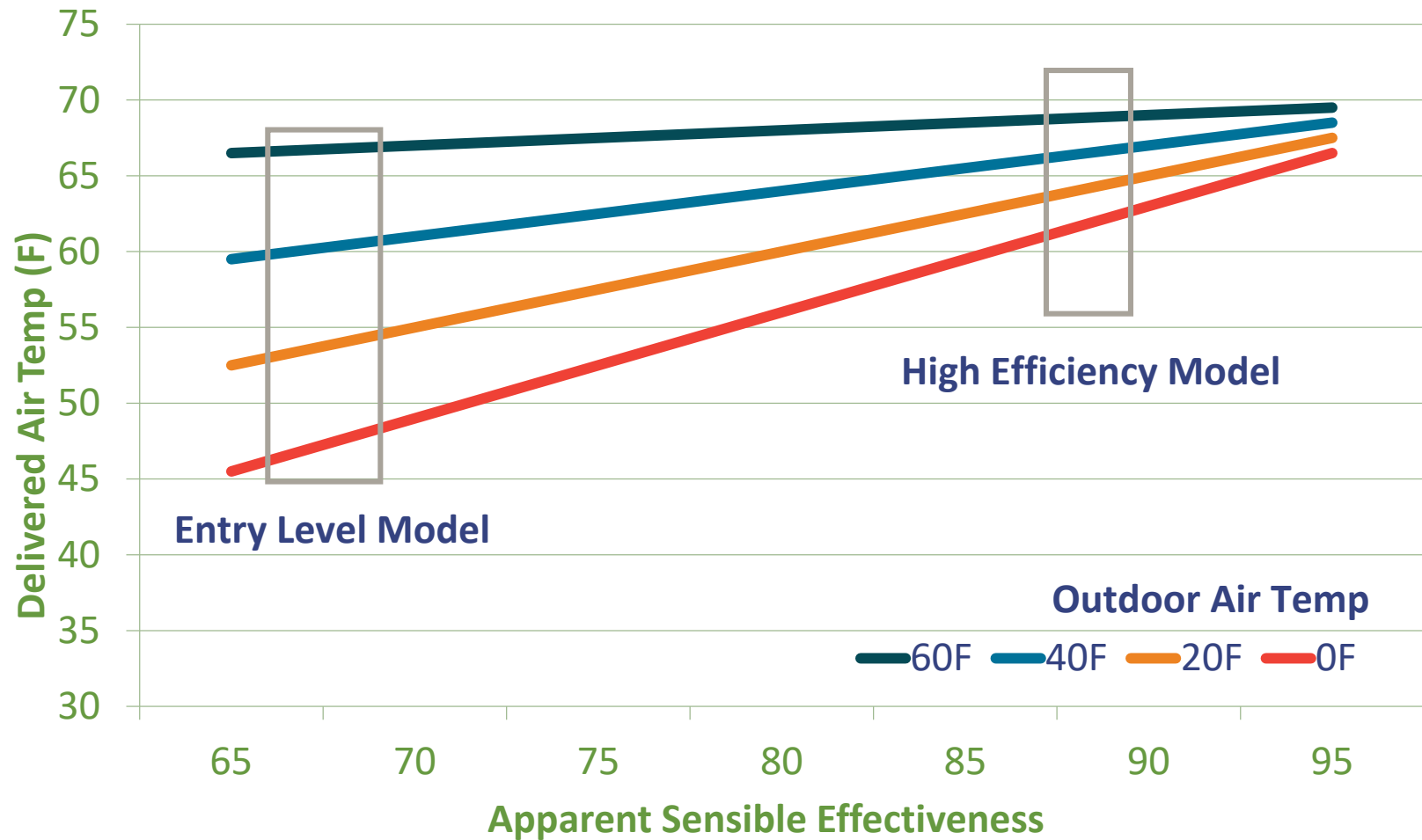
ENERGY RECOVERY VENTILATION



HRV: ENERGY PERFORMANCE TERMS

Efficiency Term	Definition
Sensible Recovery Efficiency (SRE)	SRE quantifies the amount of heat recovered by the incoming fresh air from the exhaust air. It is reported as a percentage of the total sensible heat that is available for recovery.
Apparent Sensible Effectiveness (ASE)	Unlike the SRE, the ASE includes the energy lost from fans with poor efficacy (high energy use for fan operation), heat leaking in or out of the HRV case, and any leaks between the airstreams as they cross through the HRV core.
Total Recovery Efficiency (TRE)	TRE gives the energy recovered by the ERV including both sensible (temperature) heat and latent (moisture) heat. It is similar to the SRE, and expressed as a percentage of the total available energy for recovery.

WHY HIGH EFFICIENCY MATTERS



DEFINITIONS & EFFICIENCY DATA ONLINE

- ◆ Heating and Ventilation Institute: www.hvi.org

The screenshot shows the homepage of the Home Ventilating Institute (HVI). The browser address bar displays "https://www.hvi.org". The main navigation menu includes "Home", "Site Map", "Contact Us", and "Newsroom". A search bar is located on the right. Below the navigation, there are two prominent buttons: "HVI-Certified Products Directory" (highlighted with a red circle) and "View Listing of All HVI Members". A secondary navigation bar contains "About Us", "HVI-Certified Products Directory", "HVI-Certified Ratings Programs", "Membership Services", "Manufacturers", "Resources", "Calendar of Events", and "Member Login". The main content area features a large graphic with the HVI logo and the tagline "Advancing the Value of Residential Ventilation for Healthier Living®". Below the graphic, the text reads "welcome" and "Founded in 1955, HVI certifies a wide range of home ventilating products manufactured by companies located throughout the world which produce the vast majority of the residential ventilation products sold in North America." On the right side, there is a "Quick Links" section with several links: "Some Products Not Rated for Sound", "Benefits of Good Ventilation", "How Much Ventilation Do I Need?", "Bathroom Ventilation Guidelines", "Strategies to Improve Indoor Air Quality", "Continuous Whole House Ventilation", "Ventilation Strategies for Kitchens", and "FAQs".

NEW CONSTRUCTION VS. RETROFIT CONSIDERATIONS

Consideration	New Construction	Existing Buildings
Ventilation requirements	MUST meet ASHRAE 62.2 or 90.1	<i>Should</i> meet ASHRAE 62.2 or 90.1
Constructability	Can design your system early and build around it. Think VHAC for balanced ventilation	May be limited by building dimensions and more typically approach as H/AC and V
Need	Tighter buildings need well controlled ventilation for fresh air and thermal comfort	Typically leakier buildings, but may have strategies designed to tighten as part of retrofit
Design	Control strategies for tighter buildings, may incorporate spot exhaust plans	Control strategies for moderately tight buildings, may need to integrate into existing systems

HRV/ERV: CONTROL STRATEGIES

Climate	Airtightness [ACH @ 50 Pa]	Minimum Control Strategy
Coastal /Maritime Climate Zones (<i>Higher Humidity Springs/Winters</i>) <ul style="list-style-type: none"> • Zone 4C in Oregon 	≤ 3.0	Continuous low speed with manually operated high speed
	3 to 5	
	5 to 7	Time-of-day timer with ability to operate continuously
	≥ 7	On/off, time-of-day timer
Non-Coastal / Continental Climate Zones (<i>Lower Humidity Winters</i>) <ul style="list-style-type: none"> • Zone 5 in Oregon 	≤ 3.0	Continuous low speed with manually operated high speed
	3 to 5	Time-of-day timer with ability to operate continuously
	≥ 5	On/off, air time-of-day timer

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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