



March 16, 2021

Debi Barnes Wood
BCD Coordinator
Building Code Division
1535 Edgewater St. NW, Salem, OR 97304

To the staff of the Building Codes Division (BCD) and members of the Residential and Manufactured Structures (RMSB) and Construction Industry Energy Board (CIEB),

Please accept this testimony on behalf of the Zero Energy Ready Oregon coalition (ZERO). The ZERO coalition is comprised of Oregon non-profits, Oregon city governments, builders, Architects, engineers, and individuals that are interested in seeing the advancement of energy-related building performance in Oregon so that by the year 2030 new construction practices have adopted all the known methods that are economically feasible. ZERO supports the goals laid out in the Governor's Executive Orders 17-20 and 20-04 that provide direction for building code work in Oregon.

ZERO is supportive of the proposed 2021 Oregon Residential Reach Code (ORRC) as presented by BCD staff and the recommendation for that proposal to go into effect on April 1st, 2021. ZERO submitted a proposal on December 16th, 2020 during the ORRC development process that was conducted by BCD staff and open to the public. ZERO appreciates that BCD staff took the time to have that public proposal process since Oregon Revised Statutes do not require that when developing a Reach code.

The ZERO proposal for the ORRC contained supporting documentation on energy savings and constructions costs. At the request of BCD staff, the ZERO coalition also provided more detailed construction cost information on March 12, 2021. That information is also attached to this letter.

The ZERO coalition believes that the proposed 2021 ORRC represents a solid model for what could later be adopted as the 2023 Oregon Residential Specialty Code (ORSC) because the proposed 2021 ORRC meets code-related elements EO 17-20 specifies for the 2023 ORSC, such as; providing equivalent energy performance to the DOE Zero Energy Ready standard, Solar-Ready, and EV-Ready provisions.

Thank you for the opportunity to participate in the development if the 2021 ORRC,

David Heslam

Policy Committee Co-Chair of the ZERO coalition

Detailed Cost Information to Support the 2021 ORRC Proposal submitted by the ZERO Coalition

Incremental Costs for Gas-Heated Home		
Component Description	Component Incremental Cost	Basis of Incremental Cost
Prescriptive U .57 Walls	-\$1,980	From discussions with three Oregon builders; average savings of 6% on lumber package from switching to 24" o.c. studs from 16" o.c. studs. 2020 lumber prices were abnormally high, so 2019 lumber prices were used to avoid over estimating lumber costs/savings in future years. \$15/sf was used as the lumber cost factor. For a 2,200 sf home that resulted in a savings of -\$1,980.
Prescriptive air leakage <4 ACH50 and tested	\$200	Incremental cost of \$200 to perform air leakage testing. Sourced from Oregon providers of this service.
Prescriptive duct leakage <4 CFm/100 sq ft and tested	\$300	The NPCC Sixth Power Plan assumes \$300 for duct testing. https://www.nwcouncil.org/energy/previous-energy-plans/6/sixth-northwest-conservation-and-electric-power-plan-0
Selected option of 94% AFUE Furnace	\$500	Oregon utility program estimates for the full market incremental installed cost of the 94% furnace over 80% furnace in new construction.
Selected option of UEF 0.90 Water Heater	\$720	From utility program data the average incremental cost is \$720 inclusive of the unit cost, larger gas line, exhaust/intake flues. Confirmed by comparing to cost estimates from a water heater installation company.
Selected option of 3 ACH50 Air Leakage Control and HRV with SRE of 0.66	\$1,050	The is no incremental cost of caulk, foam sealant and labor to go from 4 ACH50 to 3 ACH50 since the difference is based on technique that is learned through repeated experience with in-field testing. \$1,050 is the incremental cost for installation of an HRV in lieu of the fans and equipment associated with the code minimum balanced whole house ventilation system. HRV cost is estimated at \$0.75/sf from RTF or \$1,650 for a 2,200 sf house. \$600 was deducted for the cost of the code minimum system. https://rtf.nwcouncil.org/work-products/supporting-documents/measure-specific-supporting-files
Total	\$790	

Detailed Cost Information to Support the 2021 ORRC Proposal submitted by the ZERO Coalition

Incremental Costs for Electric-Heated Home		
Component Description	Component Incremental Cost	Basis of Incremental Cost
Prescriptive U .57 Walls	-\$1,980	From discussions with three Oregon builders; average savings of 6% on lumber package from switching to 24" o.c. studs from 16" o.c. studs. 2020 lumber prices were abnormally high, so 2019 lumber prices were used to avoid over estimating lumber costs/savings in future years. \$15/sf was used as the lumber cost factor. For a 2,200 sf home that resulted in a savings of -\$1,980.
Prescriptive air leakage <4 ACH50 and tested	\$200	Incremental cost of \$200 to perform air leakage testing. Sourced from providers of this service.
Prescriptive duct leakage <4 CFm/100 sq ft and tested	\$300	The NPCC Sixth Power Plan assumes \$300 for duct testing. https://www.nwcouncil.org/energy/previous-energy-plans/6/sixth-northwest-conservation-and-electric-power-plan-0
Selected option of HSPF 10.0 Air Source Heat Pump	\$2,400	Cost estimate comes from a major distributor for centrally ducted air source heat pump installations. It costs \$1400 for updating from 8.2 to 9 HSPF and \$1000 for updating from 9 to 10 HSPF.
Selected option of UEF 2.90 Heat Pump Water Heater	\$874	From the Regional Technical Forum the incremental cost is \$874. Confirmed by comparing to cost estimates from a water heater installation company.
Selected option of 3 ACH50 Air Leakage Control and HRV with SRE of 0.66	\$1,050	The is no incremental cost of caulk, foam sealant and labor to go from 4 ACH50 to 3 ACH50 since the difference is based on technique that is learned through repeated experience with in-field testing. \$1,050 is the incremental cost for installation of an HRV in lieu of the fans and equipment associated with the code minimum balanced whole house ventilation system. HRV cost is estimated at \$0.75/sf from RTF or \$1,650 for a 2,200 sf house. \$600 was deducted for the cost of the code minimum system. https://rtf.nwcouncil.org/work-products/supporting-documents/measure-specific-supporting-files
Total	\$2,844	

Detailed Cost Information to Support the 2021 ORRC Proposal submitted by the ZERO Coalition

Incremental Costs for PV-Ready Provisions		
Component Description	Incremental Cost	Basis of Incremental Cost
PV-ready materials and labor	\$0	Energy trust has discussed the costs to achieve the Solar Ready provisions of the proposed 2021 ORSC with their trade allies who are familiar with performing this work. Energy Trust estimates those costs at \$400 per home. Since those costs are covered in base code, they are not included for the Reach code. Costs for creating space on the roof for the solar array are indicated as \$0 because we estimate that the cost to eliminate roof penetrations in the array area to be a project planning/design issue, not an area of extra work during construction.

Incremental Costs for PV-Ready Provisions		
Component Description	Incremental Cost	Basis of Incremental Cost
EV-ready materials and labor	\$120	When Energy Trust of Oregon developed the EV Ready spec, they estimated the cost of materials including an additional branch circuit permit fee to be roughly \$100 before markup and labor, which should not be significant considering the work area is directly adjacent to the main panel in the typical scenario where the panel is located in the garage. A 20% builder markup was added to create the \$120 estimate.

Incremental Costs for WeStand Provisions		
Component Description	Component Incremental Cost	Basis of Incremental Cost
SDC reduction for lower peak water demand	-\$3,376	Average reduction in SDC charges to switch to the smaller available water meter size in a sample of 6 Oregon cities: Portland, Beaverton, Hillsboro, Wilsonville, Bend, Hood River. The lowest cost reduction was \$1,709 in Portland and the highest cost reduction was \$5,209 in Hillsboro. Typically this is a switch from a 3/4" meter to a 5/8" meter. Confirmed the capacity to achieve this savings with a production builder who is already using 5/8" meters and documenting that for water bureaus with demand calculations similar to what is in WeStand.
Plumbing pipe and fittings	-\$120	Savings estimate due to smaller diameter pipes. \$100-200 cost savings from IAPMO WeStand code development discussions per IAPMO technical committee chair. The low end \$100 figure was used and a 20% builder markup applied. Any public health cost savings from diminished chance of Legionnaires' disease is not included.
Total	-\$3,496	