TABLE N1101.1(2)
ADDITIONAL MEASURES

Envelope Enhancement Measure (Select One)	1	**High efficiency walls & windows:** Exterior walls—U-0.047/R-19+5 (insulation sheathing)/SIPS, and one of the following options: Windows—Max 15 percent of conditioned area; or Windows—U-0.30
	2	**High efficiency envelope:** Exterior walls—U-0.058/R-21 Intermediate framing, and Vaulted ceilings—U-0.033/R-30A[d,e], and Flat ceilings—U-0.025/R-49, and Framed floors—U-0.025/R-38, and Windows—U-0.30; and Doors—All doors U-0.20, or Additional 15 percent of permanently installed lighting fixtures as high-efficacy lamps or Conservation Measure D and E
	3	**High efficiency ceiling, windows & duct sealing:** (Cannot be used with Conservation Measure E) Vaulted ceilings—U-0.033/R-30A[d,e], and Flat ceilings—U-0.025/R-49, and Windows—U-0.30, and Performance tested duct systems[b]
	4	**High efficiency thermal envelope UA:** Proposed UA is 15% lower than the Code UA when calculated in Table N1104.1(1)
	5	**Building tightness testing, ventilation & duct sealing:** A mechanical exhaust, supply, or combination system providing whole-building ventilation rates specified in Table N1101.1(3), or ASHRAE 62.2, and The dwelling shall be tested with a blower door and found to exhibit no more than 1. 6.0 air changes per hour[f], ~~or~~ and ~~2. 5.0 air changes per hour[f] when used with Conservation Measure E, and~~ Performance tested duct systems[b]
	6	**Ducted HVAC systems within conditioned space:** (Cannot be used with Conservation Measure B or C) All ducts and air handler are contained within building envelope[i]
Conservation Measure (Select One)	A	**High efficiency HVAC system:** Gas-fired furnace or boiler with minimum AFUE of 90% a, or Air-source heat pump with minimum HSPF of 8.5 or Closed-loop ground source heat pump with minimum COP of 3.0
	B	**Ducted HVAC systems within conditioned space:** All ducts and air handler are contained within building envelope[i]
	C	**Ductless heat pump:** Replace electric resistance heating in at least the primary zone of dwelling with at least one ductless mini-split heat pump having a minimum HSPF of 8.5. Unit shall not have integrated backup resistance heat, and the unit (or units, if more than one is installed in the dwelling) shall be sized to have capacity to meet the entire dwelling design heat loss rate at outdoor design temperature condition. Conventional electric resistance heating may be provided for any secondary zones in the dwelling. A packaged terminal heat pump (PTHP) with comparable efficiency ratings may be used when no supplemental zonal heaters are installed in the building and integrated backup resistant heat is allowed in a PTHP
	D	**High efficiency water heating & lighting:** Natural gas/propane, on-demand water heating with min EF of 0.80, and A minimum 75 percent of permanently installed lighting fixtures as CFL or linear fluorescent or a min efficacy of 40 lumens per watt as specified in Section N1107.2[c]
	E	**Energy management device & duct sealing:** Whole building energy management device that is capable of monitoring or controlling energy consumption, and Performance tested duct systems[b], and A minimum 75 percent of permanently installed lighting fixtures as high-efficacy lamps
	F	**Solar photovoltaic:** Minimum 1 watt/sq ft conditioned floor space[g]
	G	**Solar water heating:** Minimum of 40 ft^2 of gross collector area[h]

For SI: 1 square foot = 0.093 m^2, 1 watt per square foot = 10.8 W/m^2.

a. Furnaces located within the building envelope shall have sealed combustion air installed. Combustion air shall be ducted directly from the outdoors.

b. Documentation of Performance Tested Ductwork shall be submitted to the building official upon completion of work. This work shall be performed by a contractor certified by the Oregon Department of Energy's (ODOE) Residential Energy Tax Credit program and documentation shall be provided that work demonstrates conformance to ODOE duct performance standards.

c. Section N1107.2 requires 50 percent of permanently installed lighting fixtures to contain high efficacy lamps. Each of these additional measures adds an additional percent to the Section N1107.2 requirement.

d. A = advanced frame construction, which shall provide full required ceiling insulation value to the outside of exterior walls.

e. The maximum vaulted ceiling surface area shall not be greater than 50 percent of the total heated space floor area unless vaulted area has a *U*-factor no greater than *U*-0.026.

f. Building tightness test shall be conducted with a blower door depressurizing the dwelling 50 Pascal's from ambient conditions. Documentation of blower door test shall be submitted to the Building Official upon completion of work.

g. Solar electric system size shall include documentation indicating that Total Solar Resource Fraction is not less than 75 percent.

h. Solar water heating panels shall be Solar Rating and Certification Corporation (SRCC) Standard OG-300 certified and labeled, with documentation indicating that Total Solar Resource Fraction is not less than 75 percent.

i. A total of 5 percent of an HVAC systems ductwork shall be permitted to be located outside of the conditioned space. Ducts located outside the conditioned space shall have insulation installed as required in this code.

TABLE 1101.1(3)
VENTILATION AIR REQUIREMENTS, cfm

FLOOR AREA (ft^2)	BEDROOMS				
	0-1	2-3	4-5	6-7	> 7
< 1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
> 7501	105	120	135	160	185

For SI: 1 square foot = 0.0929 m^2.

TABLE N1101.3
SMALL ADDITION ADDITIONAL MEASURES (Select one)

1	Increase the ceiling insulation of the existing portion of the home as specified in Table N1101.2.
2	Replace all existing single-pane wood or aluminum windows to the *U*-value as specified in Table N1101.2.
3	Insulate the floor system as specified in Table N1101.2 & install 50 percent of permanently installed lighting fixtures as CFL or linear fluorescent or a min. efficacy of 40 lumens per watt as specified in Section N1107.2.
4	Test the entire dwelling with a blower door and exhibit no more than 7.0 air changes per hour @ 50 Pascals.
5	Seal and performance test the duct system.
6	Replace existing 78 percent AFUE or less gas furnace with a 92 percent AFUE or greater system.
7	Replace existing electric radiant space heaters with a ductless mini split system with a minimum HSPF of 8.5.
8	Replace existing electric forced air furnace with an air source heat pump with a minimum HSPF of 8.5.
9	Replace existing water heater for a natural gas/propane water heater with a minimum EF of 0.67.
10	Install a solar water heating system with a minimum of 40 ft^2 of gross collector area.

N1101.4 Information on plans and specifications. Plans and specifications shall show in sufficient detail all pertinent data and features of the building and the equipment and systems as herein governed, including, but not limited to: exterior envelope component materials; *R*-values of insulating materials; HVAC equipment efficiency performance and system controls, lighting and other pertinent data to indicate conformance with the requirements of this chapter.

SECTION N1102
DEFINITIONS

AFUE (ANNUAL FUEL UTILIZATION EFFICIENCY) is the energy output divided by the energy input, calculated on an annual basis and including part load and cycling effects. AFUE ratings shall be determined using the U.S. Department of Energy test procedures (10 CFR Part 430) and listings in the Gas Appliance Manufacturers Association (GAMA) Consumer Directory of Certified Furnace and Boiler Efficiency Ratings.

ASHRAE is the American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc.

AUTOMATIC is self-acting, operating by its own mechanism when actuated by some impersonal influence, such as a change in current strength, pressure, temperature or mechanical configuration. (See also "Manual.")

BASEMENT WALL is the opaque portion of walls which encloses a basement and is partially or totally below grade walls.

BELOW GRADE WALLS are the walls or the portion of walls entirely below the finished grade or which extend 2 feet (610 mm) or less above the finish grade.

BTU (British Thermal Unit) is the amount of heat required to raise the temperature of 1 pound (0.454 kg) of water (about 1 pint) from 59°F to 60°F (15°C to 16°C).

BUILDING ENVELOPE is that element of a building which encloses conditioned spaces through which thermal energy may be transmitted to or from the exterior or to or from unconditioned spaces.

C (Thermal Conductance). See "Thermal conductance."

CONDITIONED SPACE is a space within the building, separated from unconditioned space by the exterior envelope which by introduction of conditioned air, by heated and/or cooled surfaces, or by air or heat transfer from directly conditioned spaces is maintained at temperatures of 55°F (13°C) or higher for heating and/or 85°F (29.4°C) or below for cooling. (Enclosed corridors between conditioned spaces shall be considered as conditioned space. Spaces where temperatures fall between this range by virtue of ambient conditions shall not be considered as conditioned space.)

COOLED SPACE is a space within a building provided with a mechanical cooling supply.

ENERGY MANAGEMENT DEVICE is a device which is installed within a dwelling that can provide near real-time data on whole dwelling energy consumption or an integrated control system that is intended to operate energy consuming appliances and/or devices for a dwelling in order to reduce energy consumption. Consumption control systems are also known as Building Automation Control (BAC) or Building Management Control Systems (BMCS).

EXTERIOR DOOR is a permanently installed operable barrier by which an entry is closed and opened. Exterior doors