Oregon High Performance Home™ Requirements

A Business Energy Tax Credit for Homebuilders

Homebuilders who construct homes to the Oregon High Performance Home™ (HPH) standard are now eligible for the Business Energy Tax Credit. The tax credit is up to $12,000. The amount varies depending on the renewable energy systems installed.

Oregon HPH designation requires that the house meets the following criteria:

- The building shell must meet specified heat loss requirements
- The house must be verified by ENERGY STAR® Homes Northwest program
- The HVAC system must be high performance
- One additional measure must be installed
- A renewable energy system must be installed

Homebuilders must apply for the tax credit **BEFORE** starting the project. The application form for the Oregon High Performance Home™ can be found on the Web at www.oregon.gov/ENERGY/CONS/BUS/docs/HPH.pdf. This form must be complete and include a $200 review charge.

The buyer of an Oregon High Performance Home™ is **not** eligible to receive any Residential Energy Tax Credits that are claimed by the homebuilder.

For information contact:

- Oregon Department of Energy HPH technical staff: 1-800-221-8035
  - Sean Henry
- ENERGY STAR® Homes Northwest program: www.northwestenergystar.com

Oregon High Performance Home™ Specifications

The following is a reprint of the Oregon High Performance Home™ (HPH) standard. It contains considerable reference to the ENERGY STAR® Homes Northwest program. Field verification of building measures will be provided by ENERGY STAR® Homes Northwest verifiers and verification of renewable energy systems will be provided by Oregon Department of Energy tax credit certified technicians.

A. Oregon High Performance Home™

1. A dwelling unit constructed by a licensed builder under the Oregon Residential Specialty Code with its own space conditioning and water heating facilities and intended for sale to an end-use homebuyer can qualify as an Oregon High Performance Home™ facility.
2. To be eligible for a Business Energy Tax Credit, a High Performance Home facility must be certified through the ENERGY STAR® Homes Northwest program, which includes builder technical assistance, independent home inspection and program quality assurance. A third party inspector certified by the Oregon Department of Energy to submit homes for certification is required. See for more information and a list of certified home verifiers in Oregon.
3. A qualifying facility must incorporate **all** of the following elements that are in addition or exception to ENERGY STAR® Homes Northwest requirements.

Building Shell

Building shell shall be constructed to the following prescriptive path:

Ceilings (including vaulted ceilings): U≤0.030 (e.g. R-49 attic or R-38 advance [standard or scissor] truss or R-38HD 2x12 joist/framing or R-60 min 6/12 roof pitch with max 2/12 ceiling pitch standard scissor truss)

Walls: above grade U≤0.050 (e.g. R-21 cavity insulation with intermediate wood framing plus R-3 continuous foam insulation or R-19 cavity insulation with intermediate wood framing plus R-4 continuous foam insulation or R-15 cavity insulation with intermediate wood framing plus R-7 continuous foam insulation)

Walls: below grade U≤0.060 (e.g. R-21 cavity insulation in wood framing)

Floors: above grade U≤0.025 (e.g. R-38 batt/blanket insulation between floor joists 16” o.c. over vented crawl)

Floors: slab-on grade, [slab edge] perimeter R-15 min. 2 feet vertical or combined vertical/horizontal – “heated” slab also requires R-10 foam board under slab. (This is a code requirement and also matches ENERGY STAR® Homes Northwest requirements.)

Windows and glass doors: U≤0.32 (weighted average). Exception: solar glazing that is part of a Renewable Energy Facility used to qualify the home as a High Performance Home may have a higher U-factor

Glazing area: glazing to floor area ratio ≤16% (including windows, skylights, and glass doors considered as glazing in code)

Shell tightness: 5.0 ACH_{50} Pa confirmed by blower door test

HVAC

HVAC systems and air ducts shall be incorporated into conditioned space, or eliminate forced- air ductwork.

Space conditioning equipment shall meet one of the following requirements:

- Two-stage gas or propane furnace, minimum AFUE 0.92,
- Gas or propane boiler, minimum AFUE 0.88
- Central AC SEER ≥14 (if installed)
- Ducted heat pump ≥HSPF 8.5, air source, and ground source COP ≥3.0
- Ductless mini-split heat pump with inverter drive, no incorporated electric backup heat, sized and installed as per ENERGY STAR® Homes Northwest specifications

Renewable Energy Systems

A renewable energy system, as described on page 4, shall provide on-site energy savings or generation of not less than 1kWh/yr per square foot of conditioned floor space.

Water Heating

Water heating systems shall meet ENERGY STAR® Homes Northwest specifications (e.g., gas: 0.61 EF for tanks ≤60 gallons, 0.60 for tanks > 60 gallons; electric: 0.93 EF for tanks ≤70 gallons, 0.92 for tanks >70 gallons), including secondary water heating equipment that backs up solar domestic water heating systems.

Additional Measure

An Oregon High Performance Home™ shall include at least **one** of the following measures:

(a) Obtain certification through a Green Building program recognized by the Oregon Department of Energy.

(b) Meet ENERGY STAR Homes Northwest ventilation specifications through the use of a heat or energy recovery ventilator, except that the sensible recovery efficiency shall be >50% at 32ºF and the EUI shall be <1.5 Watts/cfm.

(c) Use a gas or propane water heater with a minimum EF of 0.80 for primary water heating. The water heater may not also be used for space heating or as the backup to a solar water heating system to be considered a qualifying measure under this section.

Alternative Measures

Applicant may propose a package of alternate shell or HVAC measures that are equivalent to these requirements. Shell measures may be increased to offset HVAC efficiency, however, HVAC measures may not be used to reduce minimum shell requirements.

(a) Shell measures shall be a combination of assemblies that together have a total U x A no higher than a base case home described in section (3a), above. Trade-offs will be evaluated according to the thermal trade-off procedure in Oregon Residential Specialty Code Chapter 11, Energy Efficiency, Table N1104.1(1). Check with ODOE staff for assistance performing this calculation.

(b) Mechanical systems will be evaluated for comparable annual energy use.

B. Homebuilder Installed Renewable Energy System

The maximum amount of the tax credit for homebuilder-installed renewable energy systems is capped at $9,000. The credit is based on the systems' performance, not the costs of the system. Eligible renewable energy systems must meet the following criteria:

Photovoltaic
Eligible installations must have a Total Solar Resource Fraction of at least 75 percent. Total Solar Resource Fraction (TSRF) method as described in the Business Energy Tax Credit (BETC) application. Installations must be verified by a Tax Credit Certified Solar PV Technician. This verification must cover performance, longevity, and proper documentation of the facility design, operation and maintenance. Installers must provide a warranty covering all parts and labor for two years. The credit amount is based on $3 per watt of installed capacity.

Solar Domestic Water Heating
Solar thermal domestic water heating installations must have a Total Solar Resource Fraction (TSRF) of at least 75 percent and be designed to provide no less than 25 percent but not more than 70 percent of the annual domestic water heating load. Installations must be OG-300 certified. Installations must be verified by a Tax Credit Certified Solar Thermal Technician. This verification must cover performance, longevity, and proper documentation of the facility design, operation and maintenance. Installers must provide a warranty covering all parts and labor of the facility for two years. The credit amount is equal to $0.60 per kWh saved as determined by the ODOE solar domestic water heating yield table.

Active Solar Space Heating
Active solar space heating installations must demonstrate a whole building annual energy savings of at least 15 percent to be eligible. Installations that combine space heating and domestic water heating are allowed providing that the solar storage tank is not heated by a backup heat source (e.g. gas or electric water heater). Only 50 percent of the domestic water heating savings shall be counted toward the requirement for 15 percent annual heating and cooling load reduction. Installations must be verified by a Tax Credit Certified Solar Technician. This verification must cover performance, longevity, and proper documentation of the facility design, operation and maintenance. Installers must provide a warranty covering all parts and labor of the facility for two years. The credit amount is equal to $0.60 per kWh saved based on a calculation procedure approved by ODOE staff.

Passive Solar
Passive solar design strategies must demonstrate a whole building annual energy savings of at least 20 percent to be eligible. This can be achieved by either meeting the prescriptive requirements for a passive solar home under the residential energy tax credit or demonstrated with whole building energy modeling and certified by a professional engineer. The credit amount is equal to $600 per home plus $0.60 per square foot of heated floor space.

Ground Source Heat Pump
Ground source heat pumps must have a coefficient of performance (COP) of 3.5 or greater. The savings is based on the incremental savings over the energy savings provided by the ground source heat pump with a COP of 3.0. The credit amount is equal to $0.60 per kWh saved.

Other Renewable Energy Resource Systems
Other renewable energy resource systems (e.g. wind turbines, fuel cells) will be evaluated on a case-by-case basis and the credit amount will be equal to $0.60 per kWh saved. Systems must be connected to home's main service panel and installers must provide a warranty covering all parts and labor of the system for two years.

Certified Passive House
Homes that are certified through the Passive House program will comply as an Renewable Energy system. The savings is based on the incremental energy savings amount of 6,667 kWh, which is equal to a $4,000 tax credit.

Renewable Energy Equivalent Envelope
Homes that comply with the requirements specified in the table below will comply as an Renewable Energy system. The savings is based on the incremental energy savings amount of 3,333 kWh, which is equal to a $2,000 tax credit.

Glazing	Max Glazing Area	**15%** of Heated Floor Area
	Windows*	**U-0.22** max. (area weighted average)
	Skylights	**U-0.60**, (area ≤2% of heated floor area)
Infiltration		**2.5 ACH** at 50 Pa
Mechanical Ventilation		70% Efficiency Heat or Energy Recovery Ventilator
Lighting		**100% Energy Efficient** (CFLs)
Water Heating	Electric	**0.93 EF** located in conditioned space
	Gas-Fired	**0.82 EF w/sealed combustion** located in cond. space
Doors		U-0.20 (e.g. R-5 insulated doors w/thermal brk edge)
Ceiling	Flat	U-0.030 max. (e.g. R-49 std truss; R-38 **Adv** truss)
	Rafter Vault	U-0.030 max. (e.g. 2x12 R-38HD; R-38 **Adv** scissor)
	Std Scissor Truss	U-0.030 max. (e.g. 6/12 roof pitch-2/12 ceiling pitch R-60)
Floor over Uncond. Space		U-0.025 max. (e.g. crawlsp, 16"o.c., R-38 – post & beam prohibited)
Above-Grade Wall		U-0.027 (e.g. R-21, intmdt frame+**R-20 cont** or R-15 std frame + **R-25** cont, or R-35 SIP or R-36 ICF)
Below-Grade Wall		U-0.060 (e.g. R-21 interior furred wood wall)
Slab Floor - All		R-15 perimeter + R-10 under entire slab