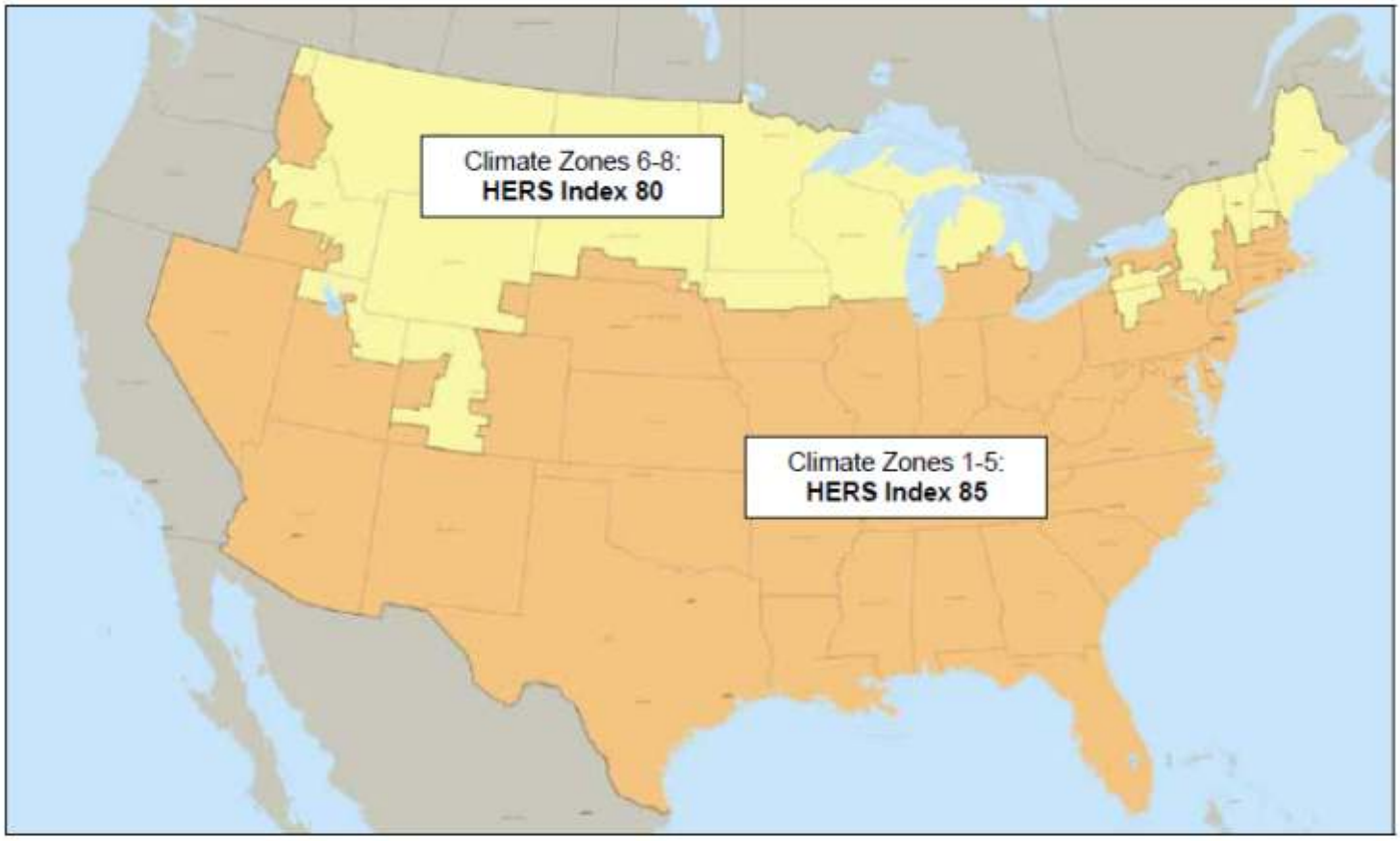
ENERGY STAR Qualified Homes
National Performance Path Requirements

ENERGY STAR Performance Requirements:

To qualify as ENERGY STAR, a home must meet the minimum requirements specified below, be verified and field-tested in accordance with the RESNET Standards by a RESNET-accredited Provider, and meet all applicable codes.

Maximum HERS Index Required to Earn the ENERGY STAR[1]



Note: Due to the unique nature of some state codes and/or climates, EPA has agreed to allow regionally-developed definitions of ENERGY STAR in California, Hawaii, and the Pacific Northwest to continue to define program requirements. The States of Montana and Idaho may use either the requirements of the national program or the regionally-developed program in the Pacific Northwest.

ENERGY STAR Mandatory Requirements:

Envelope [2,3,4]	Completed Thermal Bypass Inspection Checklist
Ductwork [5,6]	Leakage ≤ 6 cfm to outdoors / 100 sq. ft.
ENERGY STAR Products [13,14]	Include at least one ENERGY STAR qualified product category: ▪ Heating or cooling equipment [7]; OR ▪ Windows [8]; OR ▪ Five or more ENERGY STAR qualified light fixtures [9,10], appliances [11], ceiling fans equipped with lighting fixtures, and/or ventilation fans [12]
ENERGY STAR Scoring Exceptions	▪ On-site power generation may not be used to decrease the HERS Index to qualify for ENERGY STAR. ▪ A maximum of 20% of all screw-in light bulb sockets in the home may use compact fluorescent lamps (CFLs) to decrease the HERS Index for ENERGY STAR compliance. CFLs used for this purpose must be ENERGY STAR qualified.

ENERGY STAR Qualified Homes
National Performance Path Notes

1. The appropriate climate zone for each building site shall be determined by the 2004 International Residential Code (IRC), Table N1101.2. The HERS Index must be calculated in accordance with the RESNET Mortgage Industry National Home Energy Rating Standards.
2. The Thermal Bypass Inspection Checklist must be completed for homes to earn the ENERGY STAR label. The Checklist requires visual inspection of framing areas where air barriers are commonly missed and inspection of insulation to ensure proper alignment with air barriers, thus serving as an extra check that the air and thermal barriers are continuous and complete.
3. Envelope leakage must be determined by a RESNET-certified rater using a RESNET-approved testing protocol.
4. To ensure consistent exchange of indoor air, whole-house mechanical ventilation is recommended, but not required.
5. Ducts must be sealed and tested to be ≤ 6 cfm to outdoors / 100 sq. ft. of conditioned floor area, as determined and documented by a RESNET-certified rater using a RESNET-approved testing protocol. If total duct leakage is ≤ 6 cfm to outdoors / 100 sq.ft. of conditioned floor area, then leakage to outdoors does not need to be tested. Duct leakage testing can be waived if all ducts and air handling equipment are located in conditioned space (i.e., within the home's air and thermal barriers) AND the envelope leakage has been tested to be ≤ 3 ACH50 OR ≤ 0.25 CFM 50 per sq. ft. of the building envelope. Note that mechanical ventilation will be required in this situation.
6. EPA recommends, but does not require, locating ducts within conditioned space (i.e., inside the air and thermal barriers), and using a minimum of R-4 insulation for ducts inside conditioned space to prevent condensation.
7. All cooling equipment, regardless of whether it is used to satisfy the ENERGY STAR products requirement, must be sized according to the latest editions of ACCA Manuals J and S, ASHRAE 2001 Handbook of Fundamentals, or an equivalent computation procedure. Maximum oversizing limit for air conditioners and heat pumps is 15% (with the exception of heat pumps in Climate Zones 5 - 8, where the maximum oversizing limit is 25%). This can be accomplished either by the rater performing the calculations or reviewing documentation provided by the professional contractor or engineer who calculated the sizing (e.g., HVAC contractor). The following operating conditions shall be used in the sizing calculations and verified where reviewed by the rater:

   Outdoor temperatures shall be the 99.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the home's location or most representative city for which design temperature data are available. Note that a higher outdoor air design temperature may be used if it represents prevailing local practice by the HVAC industry and reflects extreme climate conditions that can be documented with recorded weather data; Indoor temperatures shall be 75^0 F for cooling; Infiltration rate shall be selected as "tight", or the equivalent term.

   In specifying equipment, the next available size may be used. In addition, indoor and outdoor coils shall be matched in accordance with ARI standards.
8. Where windows are used to meet the ENERGY STAR qualified product requirement, they shall be ENERGY STAR qualified or meet all specifications for ENERGY STAR qualified windows. Additional information can be found at www.energystar.gov/windows.
9. For the purposes of meeting the ENERGY STAR requirement, qualified lighting fixtures in the following locations cannot be counted: storage rooms (e.g., closets, pantries, sheds), or garages.
10. Efficient lighting fixtures represent a significant opportunity for persistent energy savings and a meaningful way to differentiate ENERGY STAR qualified homes from those meeting minimum code requirements. In 2008, EPA intends to propose and solicit industry comments on adding the ENERGY STAR Advanced Lighting Package (ALP) as an additional requirement for ENERGY STAR qualified homes in 2009. To learn more about the ALP, refer to www.energystar.gov/homes.
11. Eligible appliances include ENERGY STAR qualified refrigerators, dish washers, and washing machines.
12. ENERGY STAR qualified ventilation fans include range hood, bathroom, and inline fans.
13. Further efficiency and savings can be achieved by installing ENERGY STAR qualified products, in addition to those required (e.g., additional lighting, appliances, etc.). For more information, visit www.energystar.gov.
14. In homes with heat pumps that have programmable thermostats, the thermostat must have "Adaptive Recovery" technology to prevent the excessive use of electric back-up heating.

ENERGY STAR Qualified Homes
Codes & Standards Information

Insulation Requirements for the National Builder Option Package

Climate Zone	Fenestration U-Factor	Glazed Fenestration SHGC	Ceiling R-Value	Wood Frame Wall R-Value	Floor R-Value	Basement Wall R-Value	Slab R-Value & Depth	Crawl Space R-Value
1	1.20	0.40	30	13	13	0	0	0
2	0.75	0.40	30	13	13	0	0	0
3	0.65	0.40	30	13	19	0	0	5/13
4 except Marine	0.40	NR	38	13	19	10/13	10, 2 ft.	10/13
5 and Marine 4	0.35	NR	38	19 or 13+5	30	10/13	10, 2 ft.	10/13
6	0.35	NR	49	19 or 13+5	30	10/13	10, 4 ft.	10/13
7 and 8	0.35	NR	49	21	30	10/13	10, 4 ft.	10/13

Reference: 2004 International Supplement to the International Codes. Copyright 2004. Falls Church, Virginia: International Code Council, Inc. Reproduced with permission. All rights reserved. (Excerpted from 2004 IRC Table N1102.1)

The above table is provided as quick reference for determining the nominal R-values specified in the National Builder Option Package (BOP). Note that this is an excerpt and the complete envelope insulation requirements can be found in Table N1102.1 of the 2004 IRC. Insulation shall be inspected to Grade I installation as defined in the RESNET Standard by a RESNET-certified rater.

Best Practices for Sizing Air Conditioners and Heat Pumps

Best practices for sizing air conditioners and heat pumps include:

- Sizing to the manufacturers' performance data;
- Sizing the equipment for the total and latent load capacities;
- Determining the auxiliary heat balance point when sizing heat pumps; and
- Considering both the cooling and heating loads in different climates when sizing heat pumps.

ENERGY STAR Products – Average Energy Savings & Key Product Criteria

Product	Average Energy Savings	Key Product Criteria
Air Conditioner	25%	SEER ≥ 14 ; EER ≥ 11.5
Heat Pump	20%	SEER ≥ 14 ; EER ≥ 11.5; HSPF ≥ 8.2
Furnace	15%	AFUE ≥ 90% (About 15% more efficient than the minimum federal efficiency standards)

ENERGY STAR Qualified Homes
Codes & Standards Information

Product	Average Energy Savings	Key Product Criteria
Windows	Savings vary by climate region (as defined by the ENERGY STAR windows program) and home characteristics	**Northern Climate Zone:** U-Factor ≤ 0.35; SHGC ≤ Any **North/Central Climate Zone:** U-Factor ≤ 0.40; SHGC ≤ 0.55 **South/Central Climate Zone:** U-Factor ≤ 0.40; SHGC ≤ 0.40; or U-Factor≤ 0.41; SHGC ≤ 0.36 U-Factor≤ 0.42; SHGC ≤ 0.31 U-Factor≤ 0.43; SHGC ≤ 0.24 **Southern Climate Zone:** U-Factor ≤ 0.65; SHGC ≤ 0.40; or U-Factor≤ 0.66; SHGC ≤ 0.39 U-Factor≤ 0.67; SHGC ≤ 0.39 U-Factor≤ 0.68; SHGC ≤ 0.38 U-Factor≤ 0.69; SHGC ≤ 0.37 U-Factor≤ 0.70; SHGC ≤ 0.37 U-Factor≤ 0.71; SHGC ≤ 0.36 U-Factor≤ 0.72; SHGC ≤ 0.35 U-Factor≤ 0.73; SHGC ≤ 0.35 U-Factor≤ 0.74; SHGC ≤ 0.34 U-Factor≤ 075; SHGC ≤ 0.33
Dish Washers	25%	Energy Factor ≥ 0.58: At least 25% more energy efficient than minimum Federal government standards
Clothes Washers	50%	Minimum Modified Energy Factor (MEF) of 1.42
Refrigerator	15%	At least 15% more energy efficient than the minimum Federal government standard (NAECA)
Thermostat	Savings depend on homeowner use	Shipped with a default energy saving program that is capable of maintaining two separate programs and four temperature settings or more for each day
Ventilating Fans	65%	**Range hoods (up to 500 cfm):** maximum allowable sound level of 2.0 sones; minimum efficacy level of 2.8 cfm/Watt **Bathroom fans (10 to 80 cfm):** maximum allowable sound level of 2.0 sones; minimum efficacy level of 1.4 cfm/Watt; minimum rated airflow at 0.25 static w.g. 60% of 0.1 static w.g. airflow **Bathroom fans (90 to 130 cfm):** maximum allowable sound level of 2.0 sones; minimum efficacy level of 2.8 cfm/Watt; minimum rated airflow at 0.25 w.g. 70% of 0.1 static w.g. airflow **Bathroom fans (140 to 500 cfm):** maximum allowable sound level of 3.0 sones; minimum efficacy level of 2.8 cfm/Watt; minimum rated airflow at 0.25 w.g. 70% of 0.1 static w.g. airflow Light sources must use pin-based fluorescent technology Warranty provided must be a minimum of 1 year
Lighting	66%	http://www.energystar.gov/index.cfm?c=lighting.pr_lighting
Ceiling Fans	Savings depend on homeowner use	http://www.energystar.gov/index.cfm?c=ceiling_fans.pr_ceiling_fans