EnergyStar v3.2

EnergyStar v3.2 NextGEN

Presented By Robby Schwarz

Thinking ZERO to 360°
Our Plan Ahead

Key Components of an ENERGY STAR Certified Home

<table>
<thead>
<tr>
<th>Efficiency</th>
<th>• Energy rating with features locked in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort</td>
<td>• Complete thermal enclosure system</td>
</tr>
<tr>
<td></td>
<td>• Bedroom comfort vents</td>
</tr>
<tr>
<td>Air Quality</td>
<td>• Whole-house fresh air system</td>
</tr>
<tr>
<td></td>
<td>• Kitchen and bath fans that work well</td>
</tr>
<tr>
<td></td>
<td>• MERV 6+ filter, properly installed</td>
</tr>
<tr>
<td></td>
<td>• Combustion safety</td>
</tr>
<tr>
<td>Durability</td>
<td>• Complete water management system</td>
</tr>
</tbody>
</table>
The 2015 and 2018 IECC are better written versions of the 2012. No significant change in Sections 404 & R405. In 2018 significant change in Section R406.

What happened in 2021?
#1. Pending sunset of National Version 3.0

- Implementation timelines updated to reflect that homes permitted on or after Jan. 01, 2023, will be required to meet National v3.1 instead of v3.0.

Single-Family New Homes Implementation Timeline

<table>
<thead>
<tr>
<th>State / Territory</th>
<th>Homes Permitted 14 On or After This Date Must Meet the Adjacent Version &amp; Revision</th>
<th>Version</th>
<th>Revision 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL, AK, AZ, AR, CO, IN, ID, KS, KY, LA, MS, MO, NH, NC, ND, OH, OK, SC, SD, TN, VA, WV, WI, WY</td>
<td>10-01-2020</td>
<td>National v3</td>
<td>Rev. 10</td>
</tr>
<tr>
<td></td>
<td>01-01-2022</td>
<td>National v3</td>
<td>Rev. 11</td>
</tr>
<tr>
<td></td>
<td>01-01-2023</td>
<td>National v3.1</td>
<td>Rev. 11</td>
</tr>
<tr>
<td></td>
<td>01-01-2024</td>
<td>National v3.1</td>
<td>Rev. 12</td>
</tr>
</tbody>
</table>
Use EnergyStar Checklist Revision 12

#2. Incorporation of National v3.2 + misc. improvements

- Incorporated newly developed National Version 3.2 into program documents.

Side Note #1: URL has been updated in the RDRC

Side Note #2: An ‘N/A’ column has been added to the RDRC
What is a Revision?

1. It clarifies
2. It simplifies
3. It improves
EnergyStar v3.2 Certification Process

- The certification process provides flexibility

- Assess Customized specification that are equivalent in performance to the ENERGY STAR Reference Design Home through an EPA-recognized Home Certification Organization (HCO)’s Approved Software Rating Tool

- The Energy Rating Software determines the ENERGY STAR ERI Target Score, which is the highest ERI value that each rated home may achieve to earn the ENERGY STAR
EnergyStar v3.2 Certification Process

Note:

- Measures within the EnergyStar checklists that are pertinent to the home are Mandatory Requirements.

- The checklists impose constraints on the efficiency measures selected:
  - (e.g., insulation levels, insulation installation quality, window performance, duct leakage, water management)

- Furthermore, on-site power generation may not be used to meet the ENERGY STAR ERI Target.
“Learn the rules so you know how to break them properly”

Author: Dalai Lama
Date: Feb 25, 2008
For purposes of this Checklist, an air barrier is defined as any durable solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams and adequate support to resist positive and negative pressures without displacement or damage. EPA recommends, but does not require, rigid air barriers.

Insulation shall run behind interior / exterior wall intersections using ladder blocking, full length 2x6 or 1x6 furring behind the first partition stud, drywall clips, or other equivalent alternative.

The Rater shall measure and record the external static pressure in the return-side and supply-side of the system using the contractor-provided test locations. However, at this time, the Rater need not assess whether these values are within a specific range to certify the home.
Example Footnote #15

- Slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade.
- Slab insulation shall extend to the top of the slab to provide a complete thermal break.
- If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall.
- Alternatively, the thermal break is permitted to be created using ≥ R-3 rigid insulation on top of the slab. In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates).
- Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).
Example Footnote #16

- Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the house, slab insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab.

- Where specific details cannot meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the home’s certification.

- EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program.

- A list of currently exempted details is available at: energystar.gov/slabedge.
Verification and Inspection

- Energy Raters operate under an HCO certification program
- Energy Raters verify that all requirements have been met in accordance with the Mandatory Requirements for All Certified Homes and with the inspection procedures for minimum rated features in ANSI / RESNET / ICC 301
- Energy Raters submit the home to the HCO for final certification and follow the HCO’s certification and oversight procedures (e.g., quality assurance, recordkeeping, and reporting)
- The Rater is required to keep electronic or hard copies of the completed and signed National Rater checklists and the National HVAC Design Report
- It is recommended that Raters collect all checklist
EnergyStar v3.2 Certification Process

Performance Target

- V3.0: ~65-75 ERI target
- V3.1: ~55-65 ERI target
- V3.2: ~50-55 ERI target

Mandatory Features

Ensure that efficiency is not delivered by sacrificing indoor air quality, comfort, & durability

For Marshall Fire Rebuilds
Software has not been updated for modeling ESv3.2

Achieve an ERI of 50 or lower to prequalify the home
EnergyStar v3.2 Checklist

HVAC Contractor’s Responsibilities
- HVAC Design Report
- HVAC Commissioning Checklist

Energy Rater’s Responsibilities
- Energy Rater Design Review Checklist
- Energy Rater Field Checklist
- HVAC Design Supplement to Std. 310 Checklist

Builder’s Responsibilities
- BUILDER Water Management Checklist
HVAC Design Report Page 1

- Design Overview
  - One report per system installed
  - Designer information

- Whole House Controlled Mechanical Ventilation
  - Air Flow
  - Ventilation System Type and Controls
  - Sound
  - Efficiency
  - Air Inlet Location

- Room-by-Room Heating and Cooling Loads
  - Outlines parameters of design
HVAC Design Report Page 2

- Heating and Cooling equipment Selection
  - Manual S / Systems capacity
  - Air Conditioner/Heat Pump model #
  - AHRI Reference numbers
- Furnace
  - Manual S / Systems capacity
- Duct design
  - Manual D system air flow
- Room by room duct flow
HVAC Commissioning Checklist

- One Checklist per system installed
- Commissioning Overview
  - HVAC Credentialing information
- Refrigerant Charge Measurements
- Indoor HVAC Fan Air Flow Measurements
- Air Balancing of Supplies and Returns
  - Recommended but not required
## HVAC Design Supplement to Std. 310 Checklist

- Whole House Mechanical Ventilation
- Air Flow
- Systems Control
- Sound
- Efficiency
- Air Inlet Location
- Local/Spot Ventilation
- Kitchen
- Bathrooms
- Air Conditioners/Heat Pumps
- Furnaces
- Duct Design

### Table: Design Basis

<table>
<thead>
<tr>
<th>Design Basis</th>
<th>Designer Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Design Basis</td>
<td>[Designer Name]</td>
<td>[Date]</td>
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</tbody>
</table>

### Table: Dwelling Unit Mechanical Ventilation Systems Design

<table>
<thead>
<tr>
<th>System</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole House Mechanical Ventilation</td>
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<tr>
<td>Air Flow</td>
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<tr>
<td>Systems Control</td>
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<tr>
<td>Sound</td>
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</tr>
<tr>
<td>Efficiency</td>
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<tr>
<td>Air Inlet Location</td>
<td></td>
</tr>
<tr>
<td>Local/Spot Ventilation</td>
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<tr>
<td>Kitchen</td>
<td></td>
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<tr>
<td>Bathrooms</td>
<td></td>
</tr>
<tr>
<td>Air Conditioners/Heat Pumps</td>
<td></td>
</tr>
<tr>
<td>Furnaces</td>
<td></td>
</tr>
<tr>
<td>Duct Design</td>
<td></td>
</tr>
</tbody>
</table>

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Energy Rater Design Review Checklist

EnergyStar V3.2
- Choose either track A or Track B
- Track A
  - ANSI 310 HVAC Grading
  - HVAC Contractor does NOT have to be credentialed
- Track B
  - Traditional ES Compliance
  - The HVAC Contractor **Must** be credentialed

EnergyStar NextGen
- House must use Track A
Energy Rater Design Review Checklist Track A

- Builder Partnership Status
- High Performance Fenestration
- High Performance Insulation
- Review of ANSI / RESNET / ACCA Std. 310 HVAC Design Report with ENERGY STAR Supplement
HVAC Grading Update on Implementation
HVAC Design Supplement to Std. 310 Checklist

The Five Key Sequential Tasks in Standard 310

<table>
<thead>
<tr>
<th>Task 1</th>
<th>Task 2</th>
<th>Task 3</th>
<th>Task 4</th>
<th>Task 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Review</td>
<td>Total Duct Leakage</td>
<td>Blower Fan Airflow</td>
<td>Blower Fan Watt Draw</td>
<td>Refrigerant Charge</td>
</tr>
</tbody>
</table>

HVAC grading makes it easier to certify ENERGY STAR homes and apartments:

- Integrates most ENERGY STAR HVAC requirements into an ERI rating
- For eligible systems, does not require a credentialed HVAC contractor / FT agent
- For eligible systems, eliminates / streamlines the HVAC Commissioning Checklist
- Rewards proper installation with ERI points and helps meet the 45L tax credit
3. Clarifications on HVAC design documentation (cont.)

- Track A – HVAC Grading. New footnote added to Rater Design Review Checklist to reinforce when design review must be done:
  - The Std. 310 design report must **always** be collected and reviewed per the Standard’s design review criteria.
  - If the home has an AC or HP, then also meet the sizing limit in Item 4a.2.

**Example**

1. Even though home does not have forced-air systems that can be graded, collect the completed Std. 310 design report.
2. Review report to ensure it meets Std. 310 design review criteria.

- Note that no cooling sizing check is required because there is no cooling system.
#3. Clarifications on HVAC design documentation (cont.)

- Track A – HVAC Grading. Added an allowance to collect the National HVAC Design Report in lieu of the National HVAC Design Supplement to Std. 310:

> 11. As an alternative, the ENERGY STAR National HVAC Design Report may be collected in lieu of the ENERGY STAR National HVAC Design Supplement to Std. 310 for Dwellings & Units. In such cases, at least two documents will still be collected – an HVAC design report compliant with ANSI / RESNET / ACCA / ICC 310 plus the ENERGY STAR National HVAC Design Report. Note that for projects with more than one HVAC system, one ENERGY STAR National HVAC Design Report per system would need to be collected.

- This allowance is less relevant now that ENERGY STAR supplement can be printed directly from Wrightsoft and EnergyGauge.
**Energy Rater Design Review Checklist Track B**

- Builder Partnership Status
- High Performance Fenestration
- High Performance Enclosure
- Review of ENERGY STAR National HVAC Design Report
# Energy Rater Field Checklist #1

## Thermal Enclosure
- High performance Fenestration and Insulation
- Fully Aligned Air Barrier
- Reduced Thermal Bridging
- Air Sealing

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<table>
<thead>
<tr>
<th>Thermal Enclosure System</th>
<th>Most</th>
<th>Balloon</th>
<th>Rater</th>
<th>Verifed</th>
<th>N/A</th>
</tr>
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<tbody>
<tr>
<td>High Performance Fenestration and Insulation</td>
<td>❌</td>
<td>⭕</td>
<td>❌</td>
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<td>❌</td>
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<tr>
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<td>⭕</td>
<td>❌</td>
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<tr>
<td>Reduced Thermal Bridging</td>
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<td>❌</td>
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<tr>
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<td>⭕</td>
<td>❌</td>
<td>❌</td>
<td>❌</td>
</tr>
</tbody>
</table>
Energy Rater Field Checklist #2

HVAC Systems

- Heating and Cooling Equipment Grading
- Duct Quality Installation
  - Rough and Final Duct leakage testing
- Whole House Mechanical Ventilation
  - Measured ventilation rate
- Local/Spot Ventilation
- Measure flows
- Filtration
- Combustion Appliances
**Builder Water Management Checklist**

- Water Managed Site and Foundation
- Water Managed Wall Assemblies
- Water Managed Roof Assemblies
- Water Managed Building Materials

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**ENERGY STAR Single-Family New Homes**
*National Water Mgmt. System Builder Reqs.*, Version 3 / 3.1 / 3.2 (Rev. 12)

**Builder Responsibilities:**

- It is the exclusive responsibility of builders to ensure that each certified home is constructed to meet these requirements.
- It is the responsibility of each builder to maintain documentation demonstrating compliance for each individual certified home. Builders are required to develop a process to ensure compliance for each certified home (i.e., incorporate these requirements into the Scope of Work for relevant subcontractors, require the site supervisor to inspect each home for these requirements, and for sub-contracted work the certification of workmanship is required). In the event that the EPA determines that a certified home was not constructed without meeting these requirements, the home may be disqualified.

1. Water Managed Site and Foundation
   - 1.1. Impermeable surfaces (e.g., patio, porch, or place slabs; sidewalks, ramps, driveways) sized ≥ 0.25 in. per ft. away from home to edge of surface or 10 ft., whichever is less.
   - 1.2. Back fill has been compacted, and permeable surfaces shall be ≥ 2.5 in. per ft. away from home for 10 ft. Alternatively, post-treatment (e.g., biodegradable film).
   - 1.3. Drainage basin (within all slabs (e.g., slab on grade, basement slab)) except crawlspace slabs using either 2.0 mil polyethylene sheeting, taping ≥ 12 in. or ≥ 2 mil extruded polyethylene insulation with taped joints.
   - 1.4. Drainage basin at crawlspace floors using one of the following options:
     - 1.4.1. Concrete slab over one of the following materials:
       - 1.4.1.1. 6 to 9 mil polyethylene sheeting, taped ≥ 12 in. OR.
       - 1.4.1.2. 15.0 to 15.5 mil extruded polyethylene insulation with taped joints.
       - 1.4.1.3. 2.0 to 5 mil polyethylene sheeting, taped ≥ 12 in. OR.
       - 1.4.1.4. Laid-up wall or piping with flushing strips OR.
     - 1.4.2. Secured in the ground at the perimeter using staples.
   - 1.5. Exterior surface of below-grade walls of basements & unvented crawlspace as follows:
     - j) For poured concrete, concrete, & insulated concrete forms, finish with damp-proofing coating.
     - k) For precast or preformed wall panels, finish with sealed hardboard or other equivalent water-resistant coating.
   - 1.6. Class 1 vapor retarder not installed on interior side of vapor permeable insulation in exterior below-grade walls.
   - 1.7. Drains at lower level mechanically attached to foundation wall OR.
   - 1.8. Drain tile installed at basement and crawlspace walls, with the top of the drain tile below the bottom of the concrete slab or crawlspace floor. Drain tile surrounded with ≥ 2 in. of ≥ ½ in. washed or clean gravel and with gravel layer fully wrapped with fabric sheet. Drain tile level or sloped to drain to outside grade (daylight) or to a sump pit with a sump pump; if drain tile or in interior side of footing, then channel provided through footing to exterior side.

2. Water Managed Wall Assembly
   - 2.1. Flashing at bottom of exterior walls, with weep holes installed for anchored stucco or masonry veneer and weep screen for adhered stucco or masonry veneer or stucco cladding, or equivalent drainage system.
   - 2.2. Fully sealed continuous drainage plane behind exterior cladding that laps over flashing in Item 2.1 and fully sealed at all penetrations.
   - 2.3. Additional horizontal drainage plane layer provided behind all adhered stucco, masonry veneer or stucco cladding.
   - 2.4. Window and door openings fully flashed.

3. Water Managed Roof Assembly
   - 3.1. Step and kick-out flashing at all roof-wall intersections, extending a ≥ 4 in. wall surface above roof deck and integrated shingle-style with drainage plane above eave, eave flashing at all roof penetrations.
   - 3.2. For homes that don’t have a slab-on-grade foundation and do have expensive or collapsible soils, piers & piers provided that require to be protected that discharges water on the first grade ≥ 6 ft. from foundation, or to a underground catchment system not connected to the foundation drain system that discharges water ≥ 10 ft. from Foundation. Alternatives & exemptions in Sections 5.1.4 & 5.1.5
   - 3.3. Flashing in accordance with the applicable Code or Code provisions at all valleys & roof deck penetrations.
   - 3.4. In 2006 IBC Climate Zones 5 & higher, self-adhering polymer-modified bituminous membrane over flashing at edges of the roof line (≥ 2 ft. up roof deck from the interior plane of the exterior wall.

4. Water Managed Building Materials
   - 4.1. Wall-to-wall carpet not installed within ≥ 2.5 ft. of toilets, tubs, and showers.
   - 4.2. Cement board or equivalent moisture-resistant backing material installed on all walls behind tub and shower enclosures composed of tile or panel assemblies with caulked joints. Paper backed sheetrock shall not be used.
   - 4.3. In warm and humid climates, Class 1 vapor retarders not installed on the interior side of vapor permeable insulation in above-grade walls, except at shower and tub walls.
   - 4.4. Building materials with visible signs of water damage or mold not installed or allowed to remain.
   - 4.5. Framing members & insulation products having high moisture content not evidenced (e.g., with chyamy).
   - 4.6. For each condition-producing HVAC component, corrosion-resistant drain pan (e.g., galvanized steel, plastic) installed that drains to a discharge point or to a separate storage basin. Backflow prevention valve included if connected to a shared drainage system.
ENERGY STAR v3.2/NextGen Certified Homes
2. Energy Star certified Connected Heat Pump

- ENERGY STAR certified two-speed or variable-speed heat pump installed that serves the design load of each heated zone
  - In Climate Zones 5-8, installed heat pumps are ENERGY STAR Cold Climate certified
- Each heat pump
- must also meet EPA’s ‘connected’ criteria or be controlled by an ENERGY STAR certified smart thermostat
- Blower fan volumetric airflow, blower fan watt draw, and refrigerant charge are Grade I per ANSI / RESNET / ACCA Std. 310

ENERGY STAR Certified Heat Pump Water Heaters

- ENERGY STAR certified heat pump water heater that is 208/240 volts

- Each heat pump water heater has **minimum tank capacity** as follows:

<table>
<thead>
<tr>
<th>Bedrooms</th>
<th>0 – 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank Capacity</td>
<td>36</td>
<td>45</td>
<td>59</td>
<td>72</td>
</tr>
</tbody>
</table>

- Each heat pump water heater located within occupiable space has a sone rating <55 dBA
  - **Listed** Tier 3 and 4 heat pump water heaters on [NEEA’s Advanced Water Heating Specification](#)

- Each heat pump water heater meets EPA’s ‘**connected**’ criteria
4. Induction /Electric Cooking

- Cooktops and range elements/burners use induction technology
- and ovens are electric or convection
5. Electric Vehicle Charging Infrastructure

Electric Vehicle – Ready charging station:

- One parking space is provided per dwelling unit that includes all of the items:
  - A powered 208/240 receptacle is installed in garage or within 3 feet of driveway or dedicated parking space*
  - The electric service panel includes a 40-amp breaker (or greater), and panel directory identifies the branch circuit as “Electric vehicle charging”

*Footnote #10

If the addition of the 40-amp Electric Vehicle Charging branch circuit increases the electrical service to the next nominal size (i.e., from 200-amp to 400-amp service), connecting the circuit to the electrical panel is not required. The Rater shall retain a copy of the electrical sizing calculations or statement from the electrical designer for their records but need not evaluate the documentation to certify the home.
State of Colorado Electrification Incentive

- Additional $10,000

- Requires the 4 main NextGEN requirements
  1. Multi-stage ENERGY STAR certified connected heat pump
  2. ENERGY STAR certified connected heat pump water heater
  3. Induction cooktop* and electric oven
  4. Electric vehicle charging capability

5th REQUIREMENT
- Permit house using the 2021 IECC or UCBC BuildSmart Codes
The future starts here.

We are proud to offer new homes that have earned the ENERGY STAR® label. ENERGY STAR® certified new homes are scientifically designed to provide superior comfort and savings compared to most new homes currently on the market. Offering more than just efficient appliances, certified homes integrate energy efficiency from the ground up.

Get comfortable in an ENERGY STAR® certified new home.

- Designed for superior comfort.
- Contributes less greenhouse gas—inside and out.

The right choice, for today and tomorrow.

ENERGY STAR® certified new homes are environmentally and economically smart. Wave goodbye to high energy costs and hello to lower utility bills. Here’s what you can expect from your ENERGY STAR® certified new home:

- Advanced air sealing, high-performance windows and doors, and improved insulation keep your home comfortable and efficient in all kinds of weather.
- High-efficiency heating and cooling systems provide improved comfort and efficiency.
- Comprehensive water management techniques protect against moisture damage.

Built on a foundation of trust.

For more than 25 years, ENERGY STAR® certified new homes have set the standard for quality, efficiency, and lasting value.

- Most strict requirements set by the U.S. Environmental Protection Agency.
- Certified and backed by the building industry.
- Tested, trusted, retested, and certified.

A better home for a better tomorrow.

ENERGY STAR® certified new homes are par excellence. Ask your builder about ENERGY STAR® certified new homes today.

Learn more at ENERGY STAR® certified new homes at energystar.gov/newhomes.

Join the 2+ MILLION families who have made their home a star.

When your home’s a star, it deserves the spotlight.

El futuro comienza aquí.
Thank you!

Robby Schwarz
robbysbtankinc.com
303-927-0025

@ buildtankinc

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