2005 RESNET ANNUAL CONFERENCE

ENERGY STAR

ENERGY STAR Qualified Homes: Proposed 2006 Threshold

WHY NEW THRESHOLD?

ENERGY STAR

Problem:

With recent technical developments, a single HERS score no longer aligns with current HERS 86 threshold.

Modeling an old HERS 86 with new technical developments…

- *IECC becoming standard over MEC*
- *Revised HERS Guidelines (IECC-based)*
- *Revised NAECA Reqts. for A/C [13 SEER min. in 2006]*

…results in scores ranging from 82.5 to 87 with lower scores in the south.

WHY NEW THRESHOLD?

Opportunity:

Fix problems with current threshold…

- *More consistently deliver proven measures*
- *Integrate ENERGY STAR products*
- *Simplify definition*

GOALS FOR NEW THRESHOLD

Ensure:

- **'Brand' Relevance**
  Continue to represent premium product
- **Flexibility**
  Performance and Prescriptive verification options
- **Cost-Effectiveness**
  Positive cash-flow and strong present value
- **Production Builder Compatibility**
  Homes qualify with tried-and true technologies
- **Strong Role for HERS Verification**
  RESNET-accredited providers and HERS raters

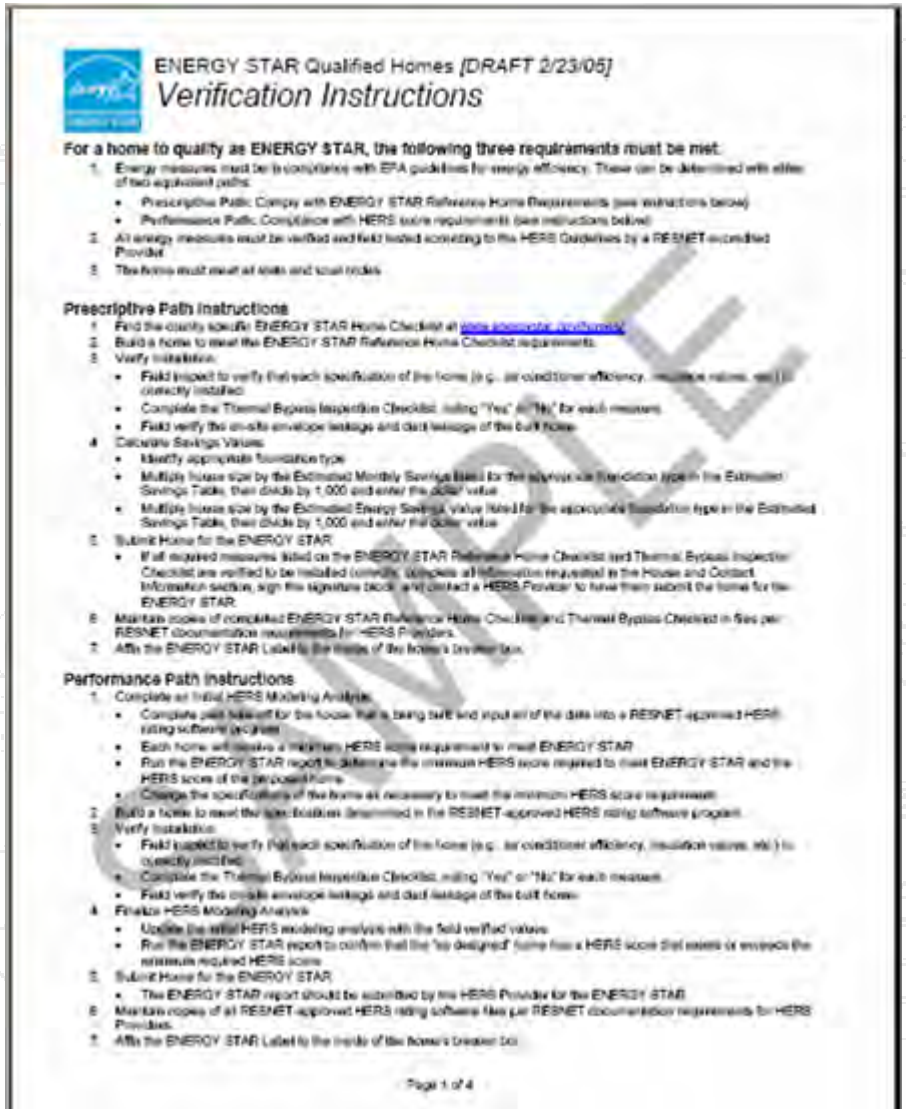
PROPOSED NEW THRESHOLD

- **PRESCRIPTIVE PATH**
  based on ENERGY STAR Reference Home

  or

- **PERFORMANCE PATH**
  Based on HERS Score

PROPOSED VERIFICATION OPTIONS



ENERGY STAR Qualified Homes *[DRAFT 2/23/05]*

Verification Instructions

For a home to qualify as ENERGY STAR, the following three requirements must be met:

1. Energy measures must be in compliance with EPA guidelines for energy efficiency. These can be determined with either of two equivalent paths:
   - Prescriptive Path: Comply with ENERGY STAR Reference Home Requirements (see instructions below)
   - Performance Path: Compliance with HERS score requirements (see instructions below)
2. All energy measures must be verified and field tested according to the HERS Guidelines by a RESNET-accredited Provider.
3. The home must meet all state and local codes.

Prescriptive Path Instructions

1. Find the county specific ENERGY STAR Home Checklist at www.energystar.gov/homes
2. Build a home to meet the ENERGY STAR Reference Home Checklist requirements.
3. Verify installation:
   - Field inspect to verify that each specification of the home (e.g., air conditioner efficiency, insulation values, etc.) is correctly installed.
   - Complete the Thermal Bypass Inspection Checklist, noting "Yes" or "No" for each measure.
   - Field verify the on-site envelope leakage and duct leakage of the built home.
4. Calculate Savings Values:
   - Identify appropriate foundation type.
   - Multiply house size by the Estimated Monthly Savings listed for the appropriate foundation type in the Estimated Savings Table, then divide by 1,000 and enter the dollar value.
   - Multiply house size by the Estimated Energy Savings value listed for the appropriate foundation type in the Estimated Savings Table, then divide by 1,000 and enter the dollar value.
5. Submit Home for the ENERGY STAR:
   - If all required measures listed on the ENERGY STAR Reference Home Checklist and Thermal Bypass Inspection Checklist are verified to be installed correctly, complete all information requested in the House and Contact Information sections, sign the signature block, and contact a HERS Provider to have them submit the home for the ENERGY STAR.
6. Maintain copies of completed ENERGY STAR Reference Home Checklists and Thermal Bypass Checklist in files per RESNET documentation requirements for HERS Providers.
7. Affix the ENERGY STAR Label to the inside of the home's breaker box.

Performance Path Instructions

1. Complete an Initial HERS Modeling Analysis:
   - Complete plan takeoff for the house that is being built and input all of the data into a RESNET-approved HERS rating software program.
   - Each home will receive a maximum HERS score requirement to meet ENERGY STAR.
   - Run the ENERGY STAR report to determine the maximum HERS score required to meet ENERGY STAR and the HERS score of the proposed home.
   - Change the specifications of the home as necessary to meet the maximum HERS score requirement.
2. Build a home to meet the specifications determined in the RESNET-approved HERS rating software program.
3. Verify Installation:
   - Field inspect to verify that each specification of the home (e.g., air conditioner efficiency, insulation values, etc.) is correctly installed.
   - Complete the Thermal Bypass Inspection Checklist, noting "Yes" or "No" for each measure.
   - Field verify the on-site envelope leakage and duct leakage of the built home.
4. Finalize HERS Modeling Analysis:
   - Update the initial HERS modeling analysis with the field verified values.
   - Run the ENERGY STAR report to confirm that the "as designed" home has a HERS score that meets or exceeds the minimum required HERS score.
5. Submit Home for the ENERGY STAR:
   - The ENERGY STAR report should be submitted by the HERS Provider for the ENERGY STAR.
6. Maintain copies of all RESNET-approved HERS rating software files per RESNET documentation requirements for HERS Providers.
7. Affix the ENERGY STAR Label to the inside of the home's breaker box.

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ENERGY STAR REFERENCE HOME

Envelope:

- ≤ 0.35 ac/h air infiltration
- IECC 2004 compliant insulation
- Thermal Bypass Checklist

Ducts:

- ≤ 4 cfm/100 sq. ft. leakage
- IECC 2004 compliant insulation

Water Heater:

- Gas 0.60 E.F.; or
- Electric 0.92 E.F.; or
- Oil integrated with boiler

HVAC:

- North: ES Heating (AFUE 90; 8.5 HSPF)
- South: ES Cooling (14 SEER, 12 EER)
- Right-Sized
- ES Thermostat

Windows:

- ES (Climate-specific)

Lighting/Appliances/Fans:

Any combination 5 ES qualified:

- Lighting Fixtures; or
- Ceiling Fans; or
- Appliances

PROPOSED NATIONAL SPECIFICATION

ENERGY STAR

National Specifications
ENERGY STAR Qualified Homes *[DRAFT 2/8/05]*

General requirements for the ENERGY STAR Reference Home are specified in the table below. For a home to qualify as ENERGY STAR, the following three conditions must be met:

1. A home must either: a) meet the reference home requirements, or b) have an energy performance that is equivalent or better than these requirements, as determined by a RESNET-accredited rating software program.
2. A home must be verified and field tested according to the HERS Guidelines by a RESNET-accredited Provider.
3. The home must meet all state and local codes.

For county specific information refer to the ENERGY STAR Qualified Homes Verification Checklist at www.energystar.gov/homes

	Hot Climates[1] (2004 IECC Climate Zones 1,2,3)	Mixed and Cold Climates[1] (2004 IECC Climate Zones 4,5,6,7,8)
Cooling Equipment[2] (Water Efficient)	Right-Sized ENERGY STAR Qualified Central A/C or Heat Pump	Right-Sized 13 SEER Central A/C or ENERGY STAR Qualified Heat Pump
Heating Equipment[2]	Right-Sized Minimum Standard Furnace, Boiler[3] or ENERGY STAR Qualified Heat Pump[3]	Right-Sized ENERGY STAR Qualified Gas Furnace, Heat Pump[3], Boiler[3] or 85% AFUE Oil Furnace
Thermostat[2]	ENERGY STAR Qualified Thermostat	
Ductwork	Leakage Sealed and Tested to ≤ 4 cfm to Outdoors / 100 sq. ft.[4] and 2004 IECC Compliant Insulation Levels[5,7]	
Envelope	Infiltration Sealed and Tested to ≤ 0.35 ach[4,6] and 2004 IECC Compliant Insulation Levels[5] and Compliance with Thermal Bypass Inspection Checklist[6]	
Windows[2,7]	ENERGY STAR Qualified Windows	
Water Heater	Gas 0.60 EF / Electric 0.92 EF / Oil Integrated with Space Heating Boiler[8]	
Lighting and Appliances[9,10]	Five or More ENERGY STAR Qualified Light Fixtures, Ceiling Fans and/or Appliances	

Map is for illustrative purposes only and is based on August 2001 Publication of the 2004 International Energy Conservation Code

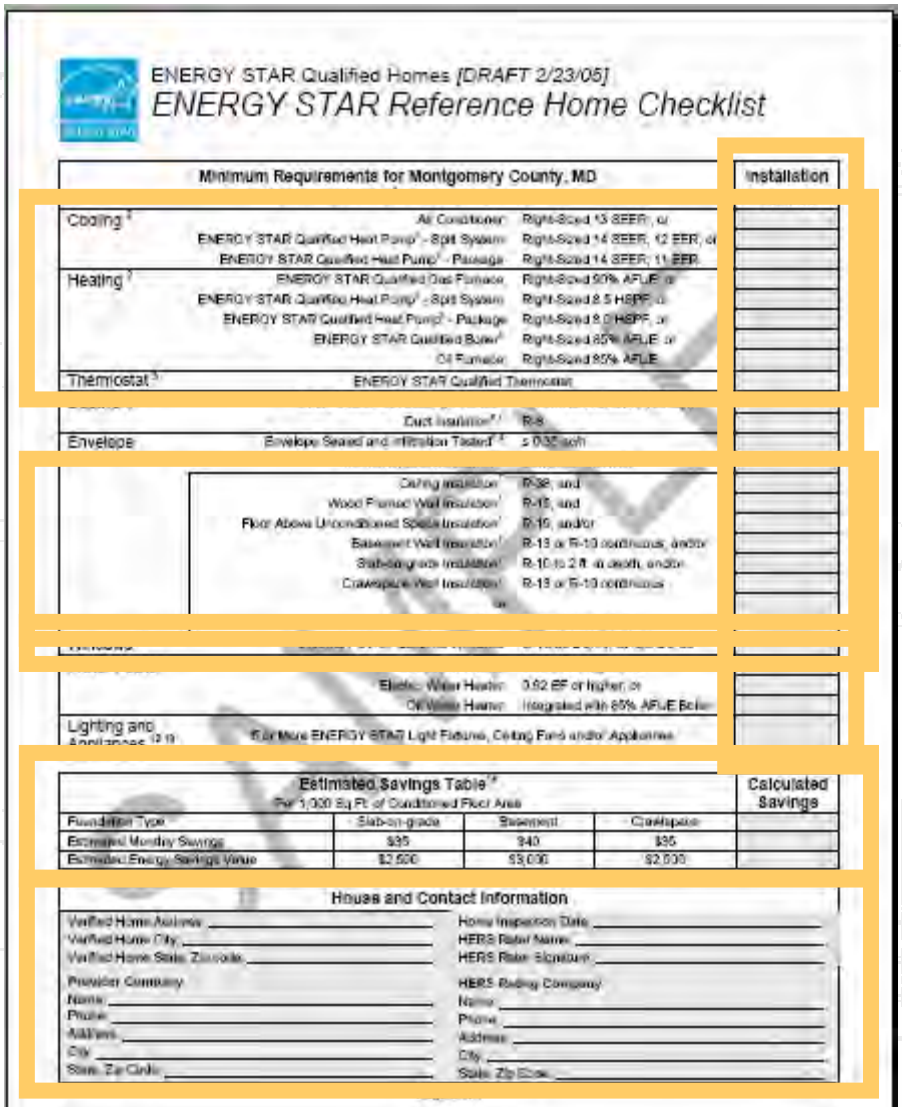
PROPSOED REGIONAL SPECIFICATION

ENERGY STAR Regional Reqts.

Insulation values From IECC table or overall U_o

EEM values

Signature Block



ENERGY STAR Qualified Homes *[DRAFT 2/23/05]*

ENERGY STAR Reference Home Checklist

Minimum Requirements for Montgomery County, MD			Installation
Cooling [1]	Air Conditioner	Right-Sized 13 SEER, or	
	ENERGY STAR Qualified Heat Pump [2] - Split System	Right-Sized 14 SEER, 12 EER, or	
	ENERGY STAR Qualified Heat Pump [2] - Package	Right-Sized 14 SEER, 11 EER	
Heating [1]	ENERGY STAR Qualified Gas Furnace	Right-Sized 90% AFUE or	
	ENERGY STAR Qualified Heat Pump [2] - Split System	Right-Sized 8.5 HSPF, or	
	ENERGY STAR Qualified Heat Pump [2] - Package	Right-Sized 8.0 HSPF, or	
	ENERGY STAR Qualified Boiler [3]	Right-Sized 85% AFUE or	
	Oil Furnace	Right-Sized 85% AFUE	
Thermostat [3]	ENERGY STAR Qualified Thermostat		
	Duct Insulation [4]	R-8	
Envelope	Envelope Sealed and Infiltration Tested [4,5]	≤ 0.35 ach	
	Ceiling Insulation	R-38, and	
	Wood Frame Wall Insulation	R-13, and	
	Floor Above Unconditioned Space Insulation	R-19, and/or	
	Basement Wall Insulation	R-13 or R-10 continuous, and/or	
	Slab-on-grade Insulation	R-10 to 2 ft. in depth, and/or	
	Crawlspace Wall Insulation	R-13 or R-10 continuous	
	or		
	Electric Water Heater	0.92 EF or higher, or	
	Oil Water Heater	Integrated with 85% AFUE Boiler	
Lighting and Appliances [2,3]	6 or More ENERGY STAR Light Fixtures, Ceiling Fans and/or Appliances		

Estimated Savings Table [6] For 1,000 Sq.Ft. of Conditioned Floor Area				Calculated Savings
Foundation Type	Slab-on-grade	Basement	Crawlspace	
Estimated Monthly Savings	$35	$40	$35	
Estimated Energy Savings Value	$2,500	$3,000	$2,500	

House and Contact Information

Verified Home Address: _____
Verified Home City: _____
Verified Home State, Zip code: _____

Home Inspection Date: _____
HERS Rater Name: _____
HERS Rater Signature: _____

Provider Company
Name: _____
Phone: _____
Address: _____
City: _____
State, Zip Code: _____

HERS Rating Company
Name: _____
Phone: _____
Address: _____
City: _____
State, Zip Code: _____

Checklist

THERMAL BYPASS CHECKLIST

ENERGY STAR Qualified Homes *[DRAFT 2/23/05]*

Thermal Bypass Inspection Checklist

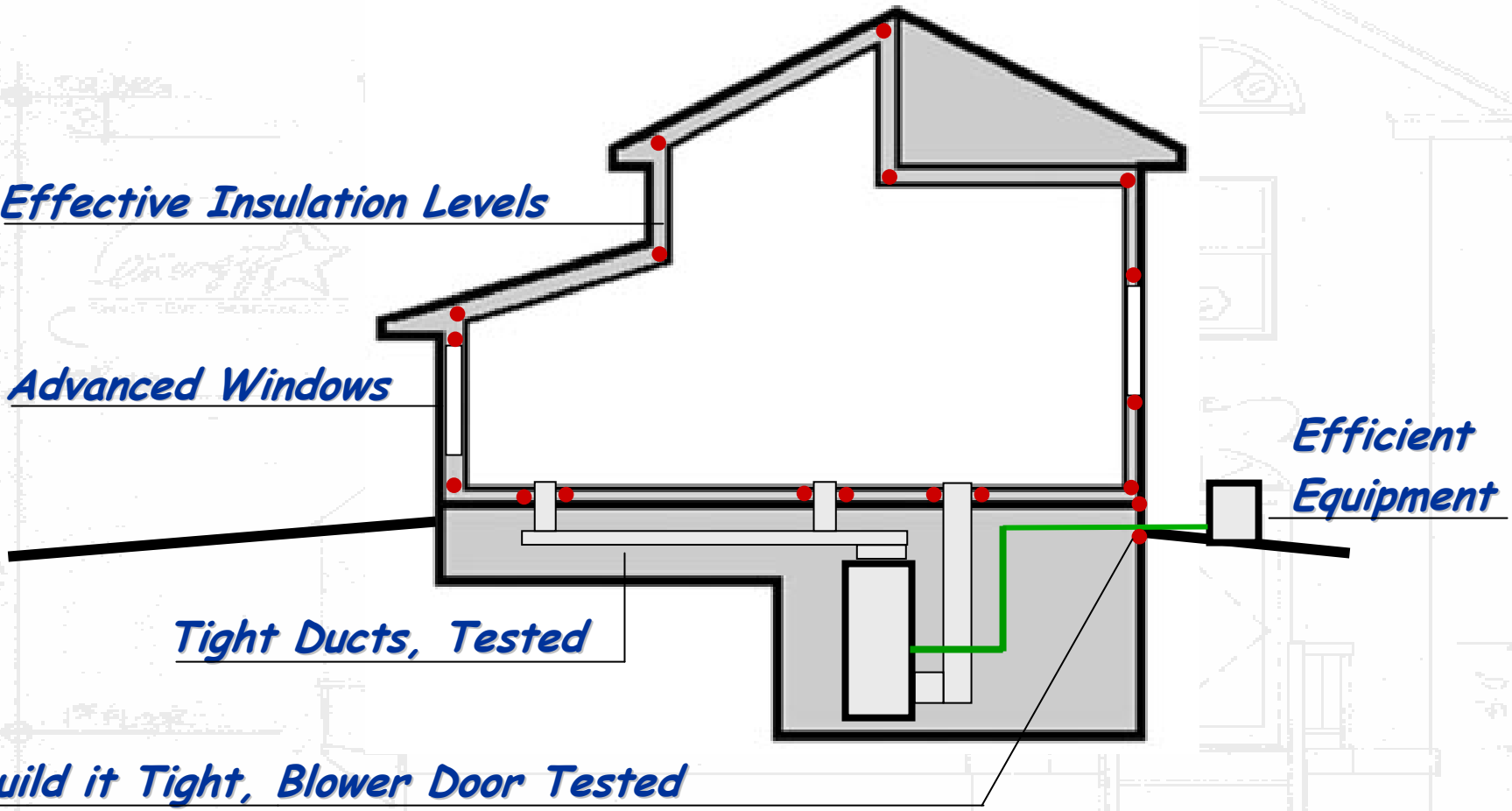
Thermal Bypass	What to Inspect	Complies (Y/N)
1. Shower/Tub at Exterior Wall	Exterior walls behind tub or shower have been fully insulated	
	Exterior walls behind tub or shower have been faced with air barrier material	
2. Insulated Floor above Garage	Floor framing is completely filled with insulation or insulation is snug against sub-floor	
	Air barrier is installed at any exposed edges of insulation	
3. Attic Knee Walls	Air barrier is installed on attic side of insulated wall	
	Insulation is in complete alignment with interior wall finish	
4. Attic Hatch/Drop-down Stair	Attic opening is fully gasketed for an air-tight fit	
	Hatch is covered with insulation that is attached and fits snugly in framed opening	
5. Cantilevered Floor	Floor framing is completely filled with insulation or insulation is snug against sub-floor	
	Air barrier installed at any exposed edges of insulation	
6. Duct Shafts	Opening is enclosed as required with flashing and any remaining gaps are sealed with caulk or foam	
7. Flue Shaft	Opening is fully enclosed as required with flashing	
	Combustion clearance between flue and combustible flashing (e.g., OSB panel) are properly closed with metal collars and any remaining gaps are sealed with fire-proof caulk or foam	
8. Piping Shaft/ Penetrations	Opening is fully enclosed as required with flashing and any remaining gaps are sealed with caulk or foam	
9. Dropped Ceiling/ Soffit	Air barrier is fully aligned with insulated framing and any gaps are fully sealed with caulk or foam	
10. Fireplace Wall	Air barrier is fully aligned with insulated framing in framed shaft behind fireplace and any gaps are fully sealed with caulk or foam	
11. Staircase Framing at Exterior Wall/Attic	Air barrier is fully aligned with insulated framing and any gaps are fully sealed with caulk or foam	
12. Whole-house Fan Attic Penetration	An insulated cover is provided that is gasketed to the framed opening	

PERFORMANCE PATH OPTION

Allows complete flexibility to choose preferred measures as follows:

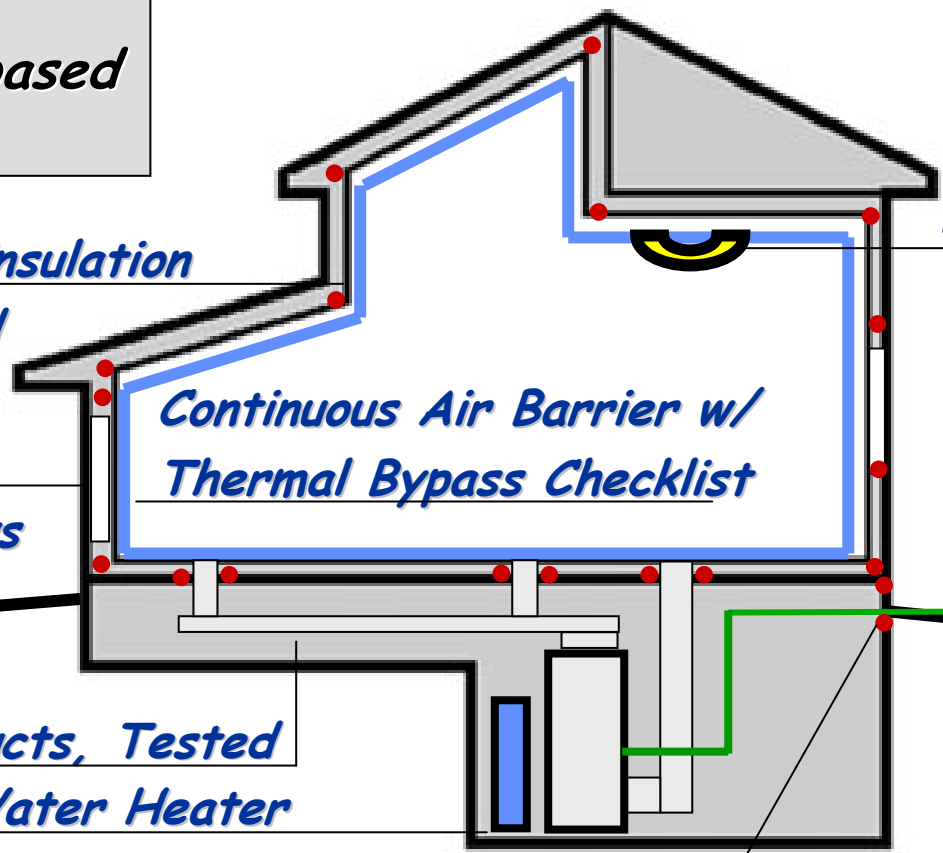
- *House plan modeled with ENERGY STAR Reference Home requirements*
- *Resulting HERS score, unique to that house plan, becomes threshold*
- *House plan modeled with preferred measures, and compliance verified if meets or exceeds HERS score threshold*

SUMMARY: ENERGY STAR NOW...



SUMMARY: ENERGY STAR FUTURE...

or, equivalent performance-based measures



IECC or Better Insulation Properly Installed

ENERGY STAR Qualified Windows

Continuous Air Barrier w/ Thermal Bypass Checklist

ENERGY STAR Qualified Lighting, Fans, or Appliances

Right-Sized ENERGY STAR HVAC Equip.

Tight Ducts, Tested Efficient Water Heater

Build it Tight with Blower Door Test and Thermal Bypass Checklist

ESTIMATED TIMELINE

Jan 2005	*EPA management review of new threshold*
Feb	*Official release of proposed threshold*
Feb/April	*Industry vetting*
May	*New threshold amended (as necessary)*
June	*New threshold released, grandfather period begins*
Jan 2006	*Grandfather period ends, all ENERGY STAR qualified homes meet new specs*