

2005 RESNET ANNUAL CONFERENCE



ENERGY STAR

A faint, light-gray architectural sketch of a house serves as the background. The sketch includes a front door, a large window, and a smaller window above the door. Several circular Energy Star labels are placed on the sketch: one on the roof, one on the upper window, one on the lower window, and one on the door. To the left of the house, there are vertical dimension lines with labels "1st FLOOR" and "2nd FLOOR".

ENERGY STAR
Qualified Homes:
Proposed 2006 Threshold

WHY NEW THRESHOLD?



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 approved 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-credited 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/homecheck.
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 cracks/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 section, 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 Checklist 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 paid software for the home that is being built and input all of the data into a RESNET-approved HERS rating software program.
 - Each home will receive a minimum HERS score requirement to meet ENERGY STAR.
 - Run the ENERGY STAR report to determine the minimum 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 minimum 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 cracks/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 exceeds or equals 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.

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



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 algorithm.
2. A home must be verified and field tested according to the HERO Guidelines by a RESNET-accredited Provider.
3. The home must meet all state and local codes.

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

	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/Wall/Unit)	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 ³	Right-Sized Minimum Standard Furnace, Boiler ⁴ or ENERGY STAR Qualified Heat Pump ⁵	Right-Sized ENERGY STAR Qualified Gas Furnace, Heat Pump ⁵ , Boiler ⁴ or 85% AFUE Oil Furnace
Thermostat ⁶	ENERGY STAR Qualified Thermostat	
Doorwork	Leakage Sealed and Tested to ≤ 4 cfm to Outdoors / 100 sq. ft. and 2004 IECC Compliant Insulation Levels ^{7,8}	
Envelope	Infiltration Sealed and Tested to ≤ 0.35 acfm ^{9,10} and 2004 IECC Compliant Insulation Levels ⁷ and Compliance with Thermal Bypass Inspection Checklist ¹¹	
Windows ¹²	ENERGY STAR Qualified Windows	
Water Heater	Gas 0.60 EF / Electric 0.92 EF / Oil Integrated with Space Heating Boiler ⁴	
Lighting and Appliances ^{13,14}	Five or More ENERGY STAR Qualified Light Fixtures, Ceiling Fans and/or Appliances	



Map is for illustrative purposes only and is based on August 2004 data from the 2004 International Energy Conservation Code.

PROPOSED 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 SEER, or ENERGY STAR Qualified Heat Pump ² - Package: Right-Sized 14 SEER, 11 SEER	
Heating ³	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 ⁴ : Right-Sized 85% AFUE or Oil Furnace: Right-Sized 80% AFUE	
Thermostat ⁵	ENERGY STAR Qualified Thermostat	
Duct Insulation ⁶	R-8	
Envelope	Envelope Sealed and Infiltration Tested ⁷ : ≤ 0.03 ach	
	Ceiling Insulation ⁸ : R-38, and Wood Framed Wall Insulation ⁹ : R-15, and Floor Above Unconditioned Space Insulation ¹⁰ : R-19, and/or Basement Wall Insulation ¹¹ : R-13 or R-10 continuous, and/or Slab-on-grade Insulation ¹² : R-10 to 2 ft. depth, and/or Crawlspace Wall Insulation ¹³ : R-15 or R-10 continuous	
Water Heating ¹⁴	Electric Water Heater: 0.92 EF or higher, or Oil Water Heater: Integrated with 85% AFUE Boiler	
Lighting and Appliances ^{15, 16}	For More ENERGY STAR Light Fixtures, Ceiling Fans and/or Appliances	

Estimated Savings Table ¹⁷ Per 1,000 Sq Ft of Conditioned Floor Area				Calculated Savings
Foundation Type	Sub-grade	Basement	Crawlspace	
Estimated Monthly Savings	\$35	\$40	\$35	
Estimated Energy Savings Value	\$2,500	\$3,000	\$2,500	

Houses and Contact Information

Verified Home Address	Home Inspection Date
Verified Home City	HERS Rater Name
Verified Home State, Zip Code	HERS Rater Signature
Provider Company	HERS Rating Company
Name	Name
Phone	Phone
Address	Address
City	City
State, Zip Code	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 clearances between flue and combustible flashing (e.g., CSB panels) 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	

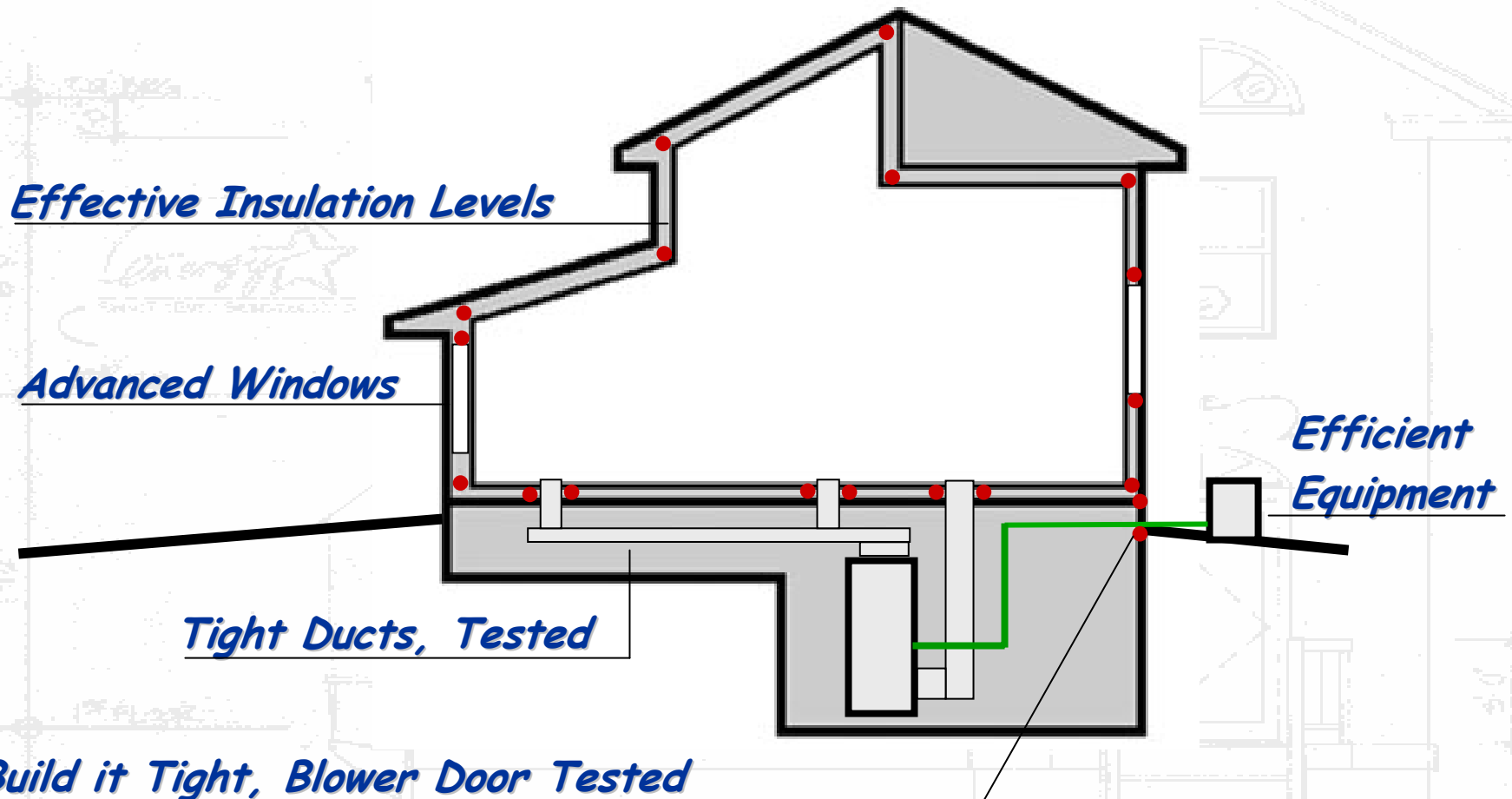
PERFORMANCE PATH OPTION



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*

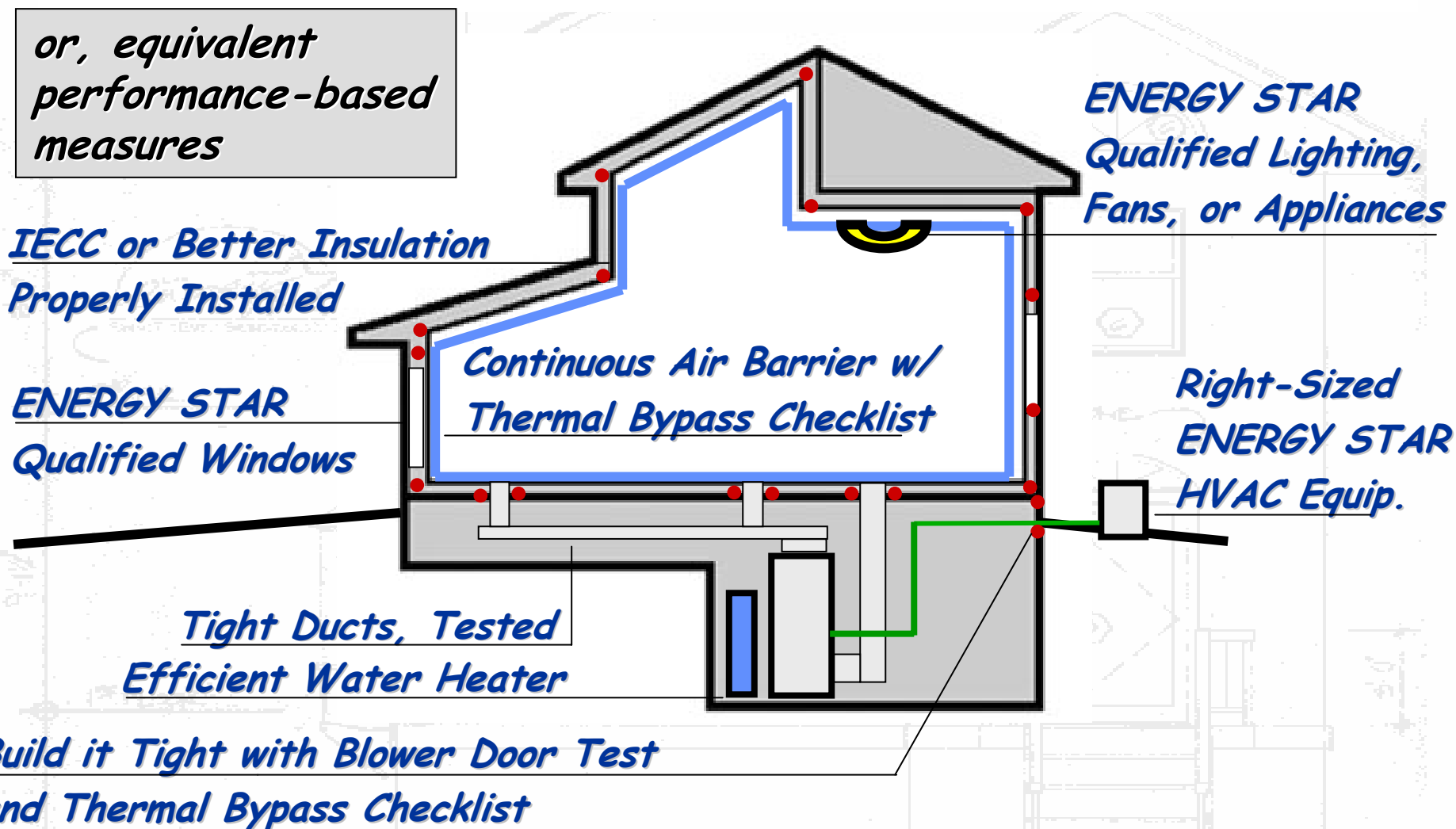
*Continuous Air Barrier w/
Thermal Bypass Checklist*

*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*