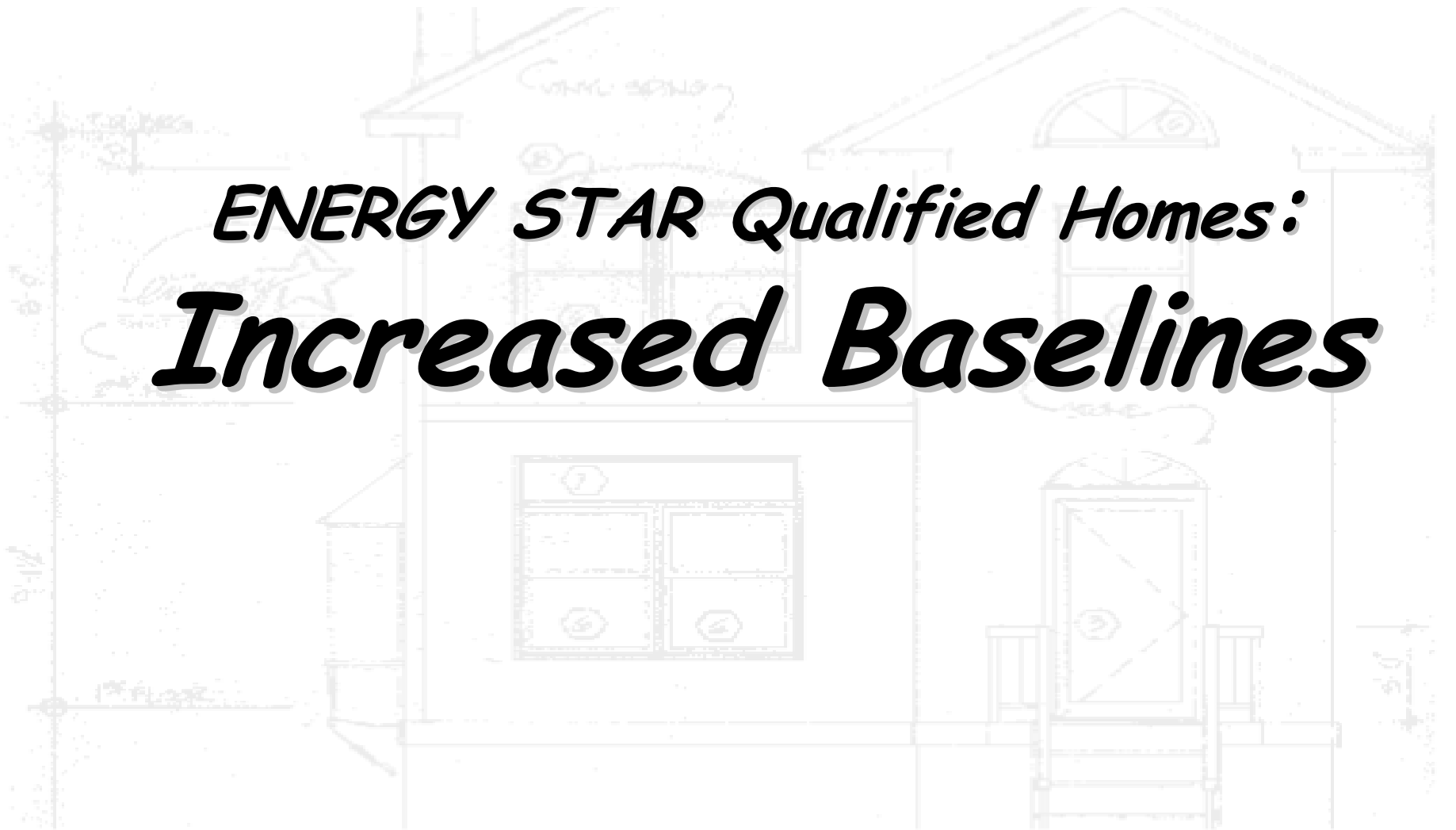


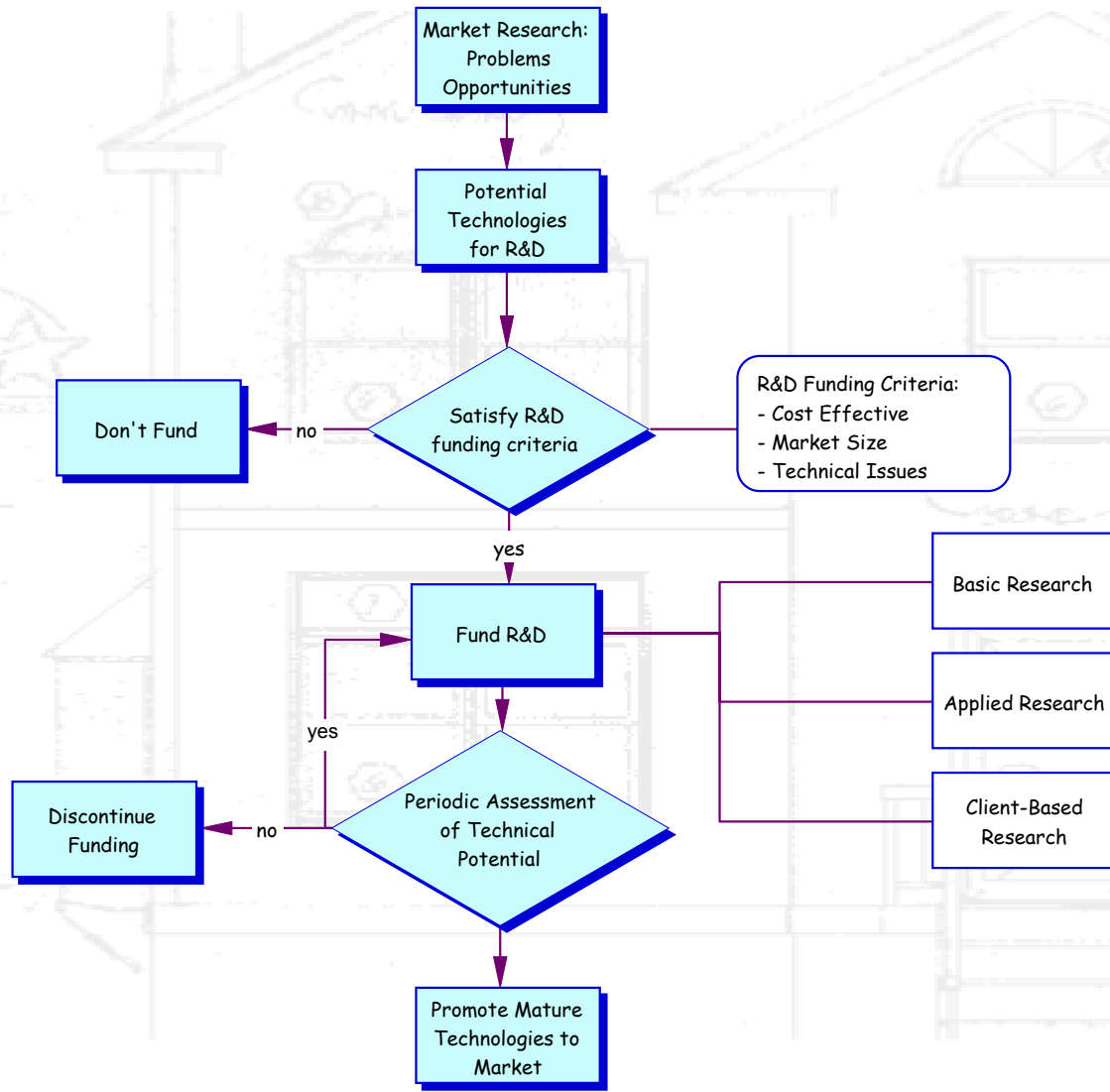
2005 NATIONAL SYMPOSIUM ON
MARKET TRANSFORMATION



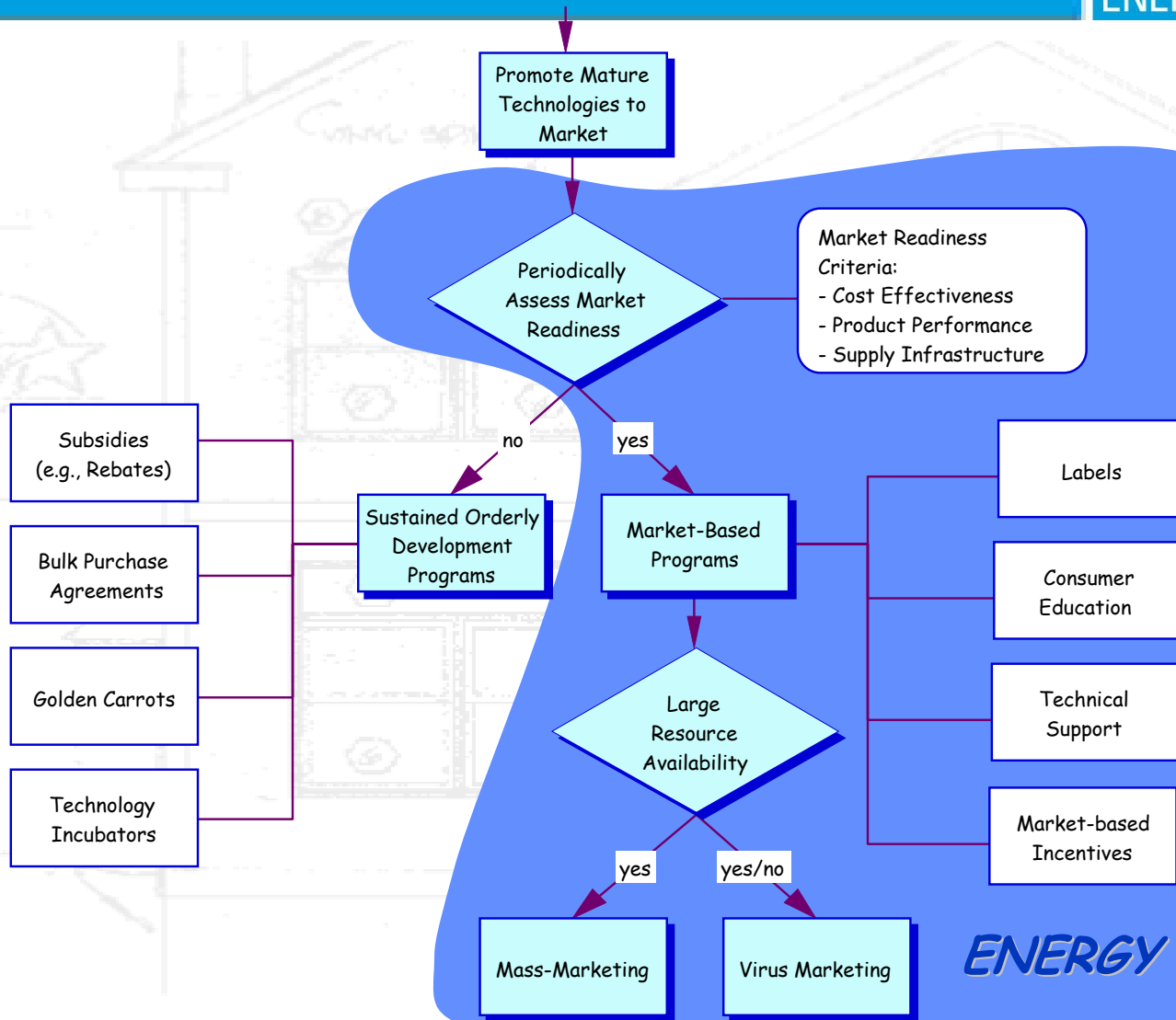
*ENERGY STAR Qualified Homes:
Increased Baselines*



ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: MARKET TRANSFORMATION CONTEXT



ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: MARKET TRANSFORMATION CONTEXT



ENERGY STAR

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: BUSINESS MODEL FOR HOMES



Production

***EPA
ENERGY STAR for Homes***

Distribution

Utilities

***HERS
Providers***

***State
Administrators***

Sales Force

***HERS
Raters***

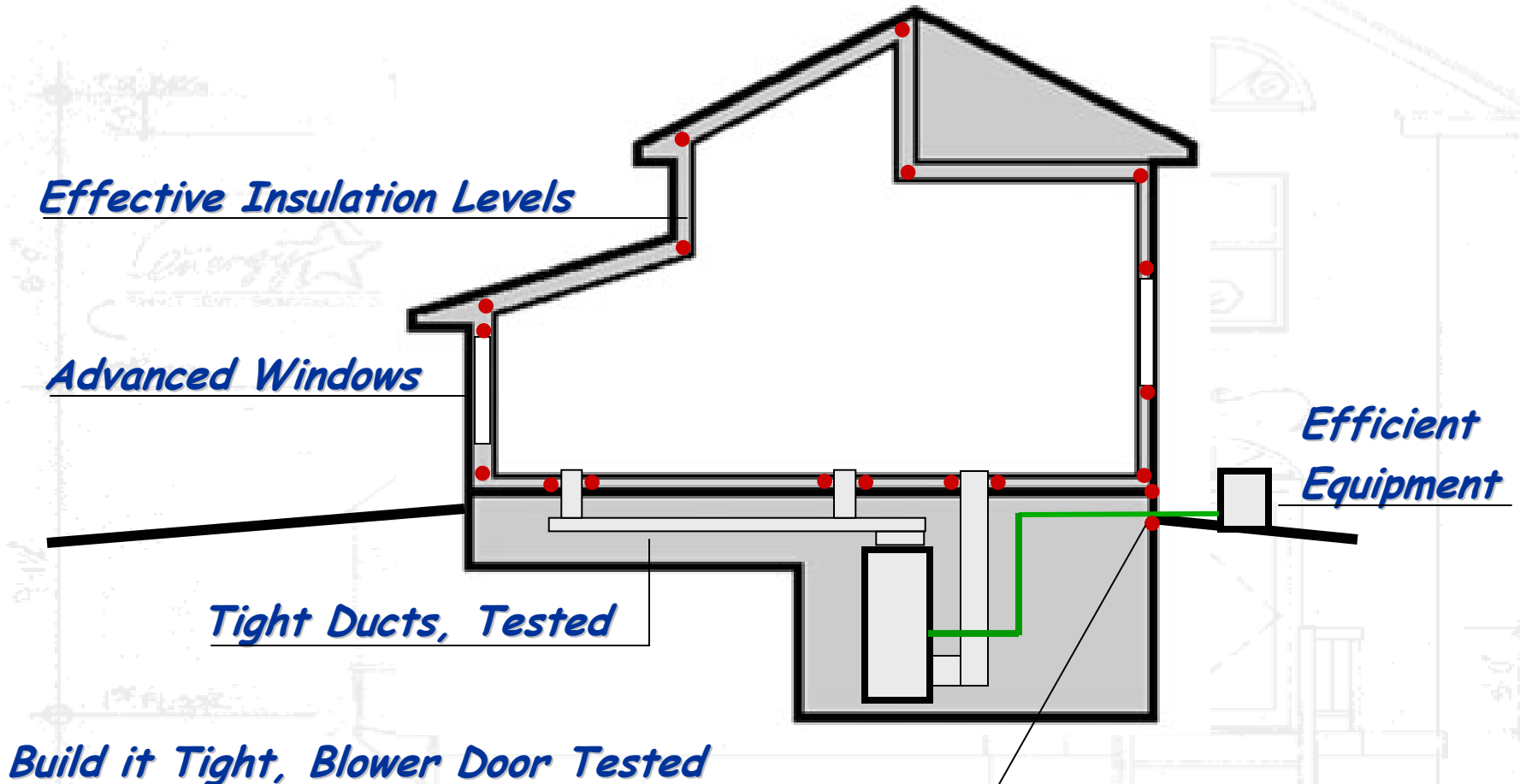
Core Customer

Builders

End Customer

***Home
Buyers***

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: ENERGY STAR CURRENT THRESHOLD



ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: 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 Reqs. for A/C [13 SEER min. in 2006]*

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

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: WHY NEW THRESHOLD?



Opportunity:

Fix problems with current threshold...

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

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: 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

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE:
PROPOSED NEW THRESHOLD



- ***PRESCRIPTIVE PATH***
based on ENERGY STAR Reference Home
or
- ***PERFORMANCE PATH***
Based on HERS Score

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: NEW THRESHOLD PRESCRIPTIVE PATH



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



ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: 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 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 (Where Provided)	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 ³	ENERGY STAR Qualified Thermostat	
Ductwork	Leakage Sealed and Tested to ≤ 4 cfm to Outdoors / 100 sq. ft. ⁴ ; and 2004 IECC Compliant Insulation Levels ^{4,7}	
Envelope	Infiltration Sealed and Tested to ≤ 0.35 ach ^{8,9} ; and 2004 IECC Compliant Insulation Levels ⁷ ; and Compliance with Thermal Bypass Inspection Checklist ¹⁰	
Windows ¹¹	ENERGY STAR Qualified Windows	
Water Heater	Gas 0.60 EF / Electric 0.92 EF / Oil Integrated with Space Heating Boiler ⁶	
Lighting and Appliances ^{12,13}	Five or More ENERGY STAR Qualified Light Fixtures, Ceiling Fans and/or Appliances	



Map is for illustrative purposes only and is based on figure 301.1 from the 2004 International Energy Conservation Code.

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: 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 ²	Air Conditioner:	Right-Sized 13 SEER ; or		
	ENERGY STAR Qualified Heat Pump ² - Split System:	Right-Sized 14 SEER, 12 EER; or		
Heating ³	ENERGY STAR Qualified Heat Pump ³ - Package:	Right-Sized 14 SEER, 11 EER		
	ENERGY STAR Qualified Gas Furnace:	Right-Sized 90% AFUE; or		
	ENERGY STAR Qualified Heat Pump ³ - Split System:	Right-Sized 8.5 HSPF; or		
	ENERGY STAR Qualified Heat Pump ³ - Package:	Right-Sized 8.0 HSPF; or		
Thermostat ³	ENERGY STAR Qualified Boiler ⁴ :	Right-Sized 85% AFUE; or		
	Oil Furnace:	Right-Sized 85% AFUE		
Envelope	Duct Insulation ^{4,5} :	R-6		
	Envelope Sealed and Infiltration Tested ⁶ :	≤ 0.35 ach		
Insulation ⁷	Ceiling Insulation ⁷ :	R-38; and		
	Wood Framed Wall Insulation ⁷ :	R-15; and		
	Floor Above Unconditioned Space Insulation ⁷ :	R-19; and/or		
	Basement Wall Insulation ⁷ :	R-13 or R-10 continuous; and/or		
	Slab-on-grade Insulation ⁷ :	R-10 to 2 ft. in depth; and/or		
	Crawspace Wall Insulation ⁷ :	R-13 or R-10 continuous		
Water Heating ⁸	Electric Water Heater:	0.92 EF or higher; or		
	Oil Water Heater:	Integrated with 85% AFUE Boiler		
Lighting and Appliances ^{12,13}	5 or More ENERGY STAR Light Fixtures, Ceiling Fans and/or Appliances			
Estimated Savings Table¹⁴				
Per 1,000 Sq Ft. of Conditioned Floor Area				
Foundation Type	Slab-on-grade	Basement	Crawlspace	Calculated Savings
Estimated Monthly Savings	\$35	\$40	\$35	
Estimated Energy Savings Value	\$2,500	\$3,000	\$2,500	
House 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

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: THERMAL BYPASS CHECKLIST



ENERGY STAR



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	

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: NEW THRESHOLD PERFORMANCE PATH



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*

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: NEW THRESHOLD 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*

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: WHY ENERGY STAR W/IAQ



- ***Add Quality*** *to ENERGY STAR Homes*
- ***Continually Improve*** *Value Proposition*
- ***Inform Consumers*** *About IAQ*

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: IAQ SPECIFICATION



- Moisture control
- Radon Control
- Pest Control
- HVAC Systems
- Combustion Safety
- Materials

Starting with
ENERGY STAR
Qualified Home...

ENERGY STAR Qualified
Lighting, Fans, or Appliances
IECC Insulation
Properly Installed

Drainage Plane
Radon Vent

Screens/Shield

Right-Sized
ES Equip.

Water Proofing

Drain Tile

Continuous Air Barrier

Pressure Balancing

Safe/Protected Mat.
ES Qualified Windows

Slope Grade

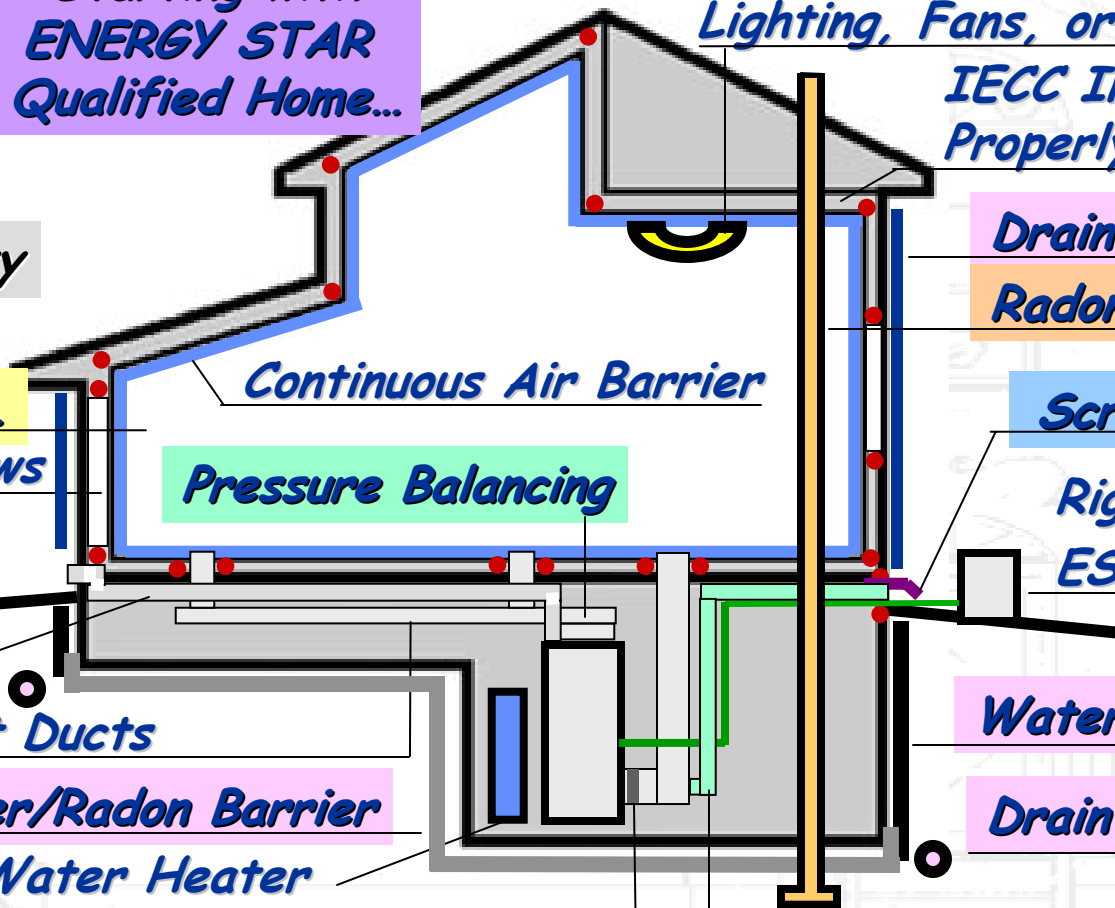
Direct/Power Vent

Tight Ducts

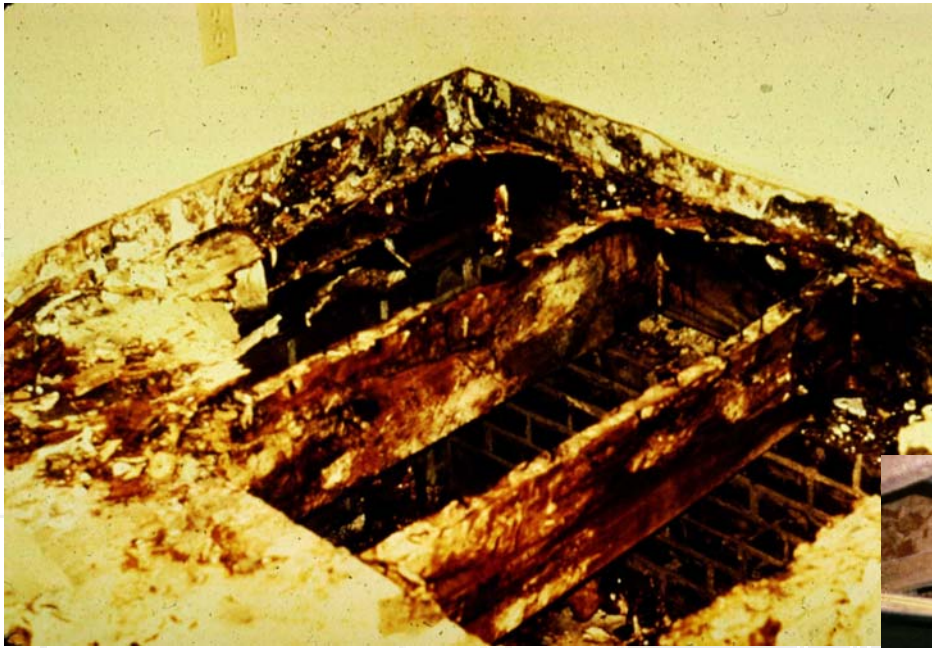
Water/Radon Barrier

Efficient Water Heater

Build it Tight, Ventilate Right, Filtration



MOISTURE CONTROL: FOUNDATION VAPOR BARRIER



Courtesy of Building Science Corp.

MOISTURE CONTROL: DOOR/WINDOW PAN FLASHING



ENERGY STAR



Courtesy of Building Science Corp.

MOISTURE CONTROL: DRAINAGE PLANE

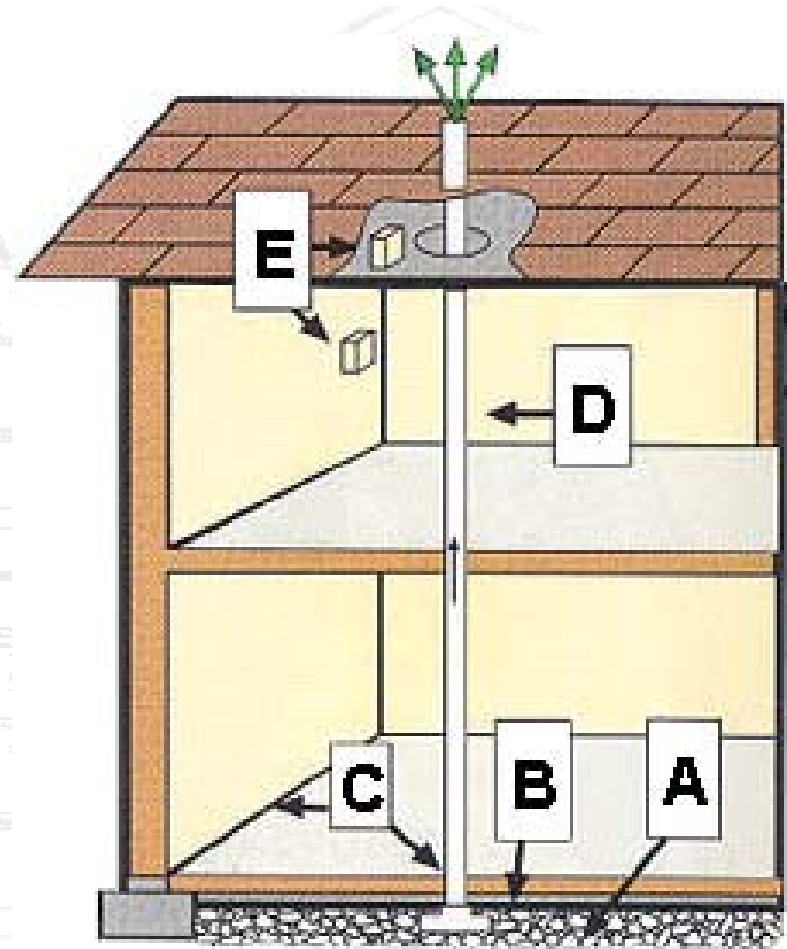


Courtesy of Building Science Corp.

RADON CONTROL: RADON RESISTANT CONSTRUCTION



- A. Gas Permeable Layer**
(4" clean gravel)
- B. Plastic Sheeting**
(under slab or over crawl space floor)
- C. Sealing and Caulking**
(all openings in concrete floor)
- D. Vent Pipe**
(3 or 4 inch PVC pipe)
- E. Junction Box**
(installed in case venting fan is needed later)

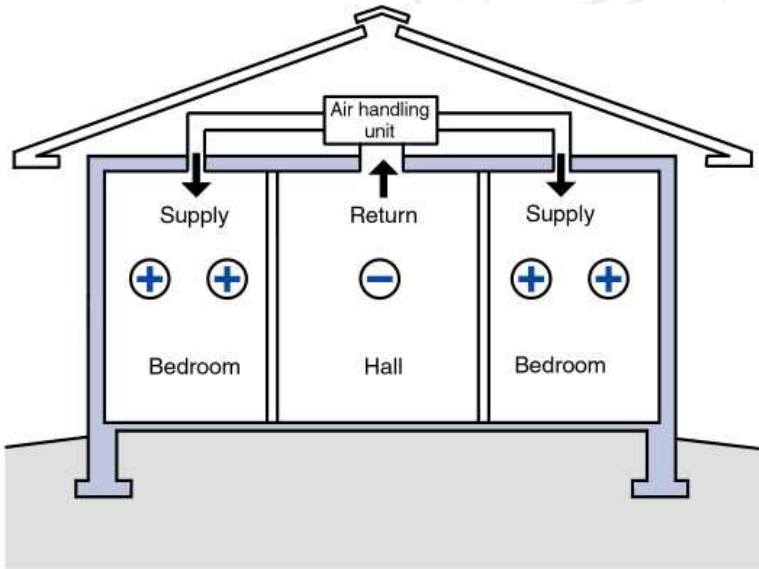


PEST CONTROL: TERMITE SHIELD



Courtesy of Building Science Corp.

HVAC SYSTEMS: PRESSURE BALANCING HOMES

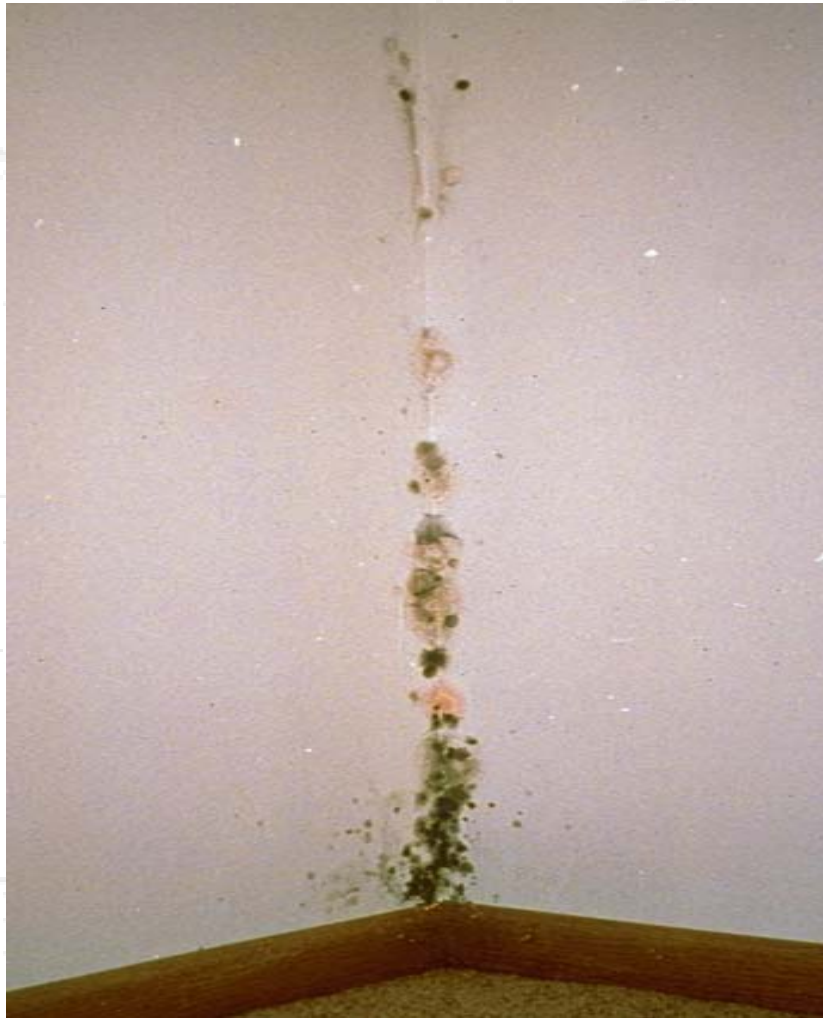


Courtesy of Building Science Corp.

HVAC SYSTEMS: MECHANICAL VENTILATION



ENERGY STAR



Courtesy of Building Science Corp.



Courtesy of D.R. Wastchak, L.L.C.

COMBUSTION SAFETY: COMBUSTION DIRECT VENTING



Courtesy of Building Science Corp.

BUILDING MATERIALS: PROTECTION



BUILDING MATERIALS: PROPER SELECTION



Courtesy of Building Science Corp.

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: IAQ LABEL COST ANALYSIS



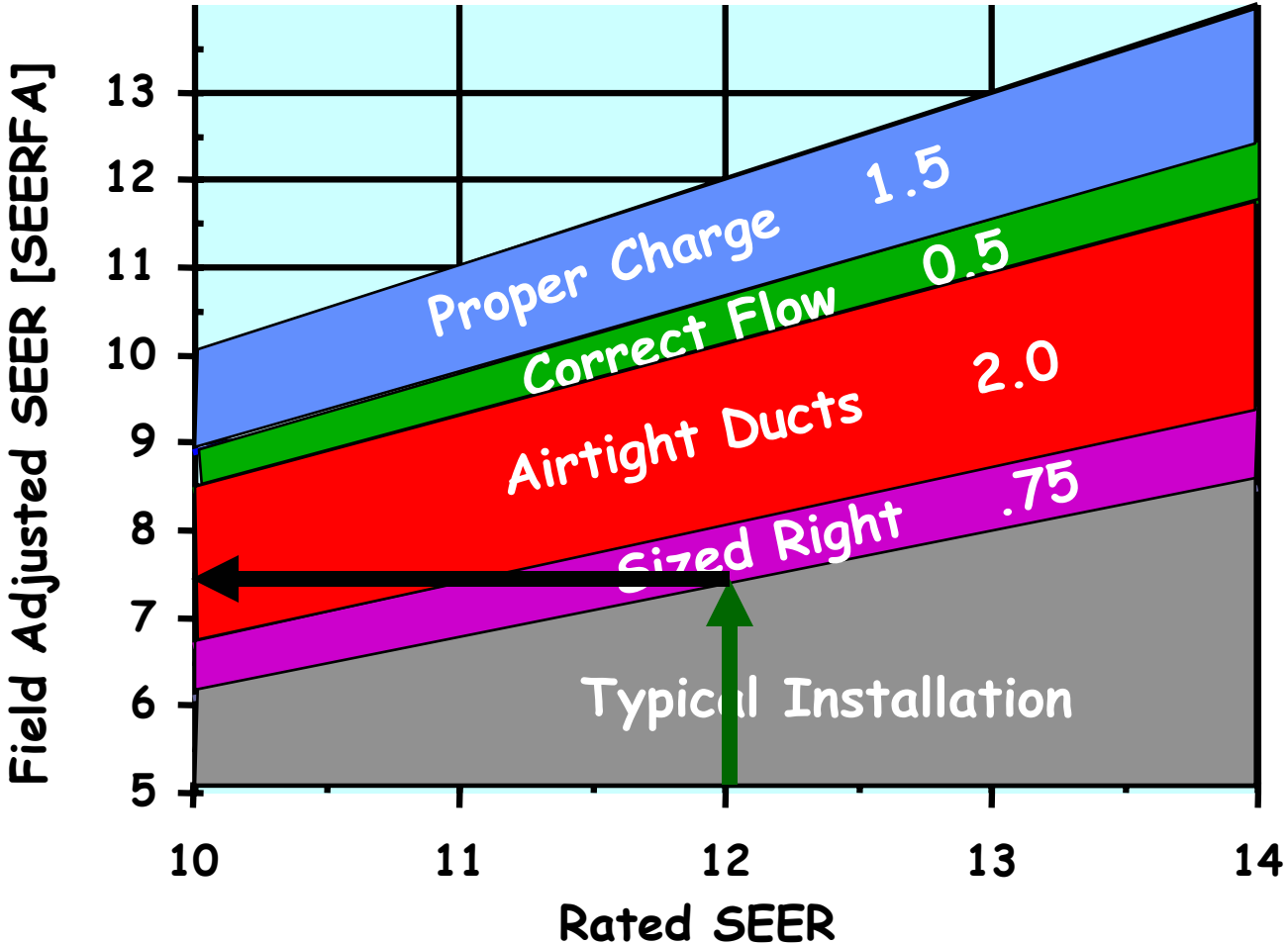
IAQ Cost Analysis

IAQ Measures	Cost by Builder Type		
	Advanced	Progressive	Basic
Moisture Control	\$100	\$950	\$4,240
Radon Control	\$250	\$250	\$250
Pest Control	\$280	\$280	\$370
HVAC Systems	\$360	\$850	\$1,370
Combustion Safety	\$0	\$670	\$670
Materials	\$200	\$300	\$300
Commissioning	\$250	\$250	\$225
Total	\$1,440	\$3,550	\$7,425

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: IMPACT OF INSTALLATION FACTORS

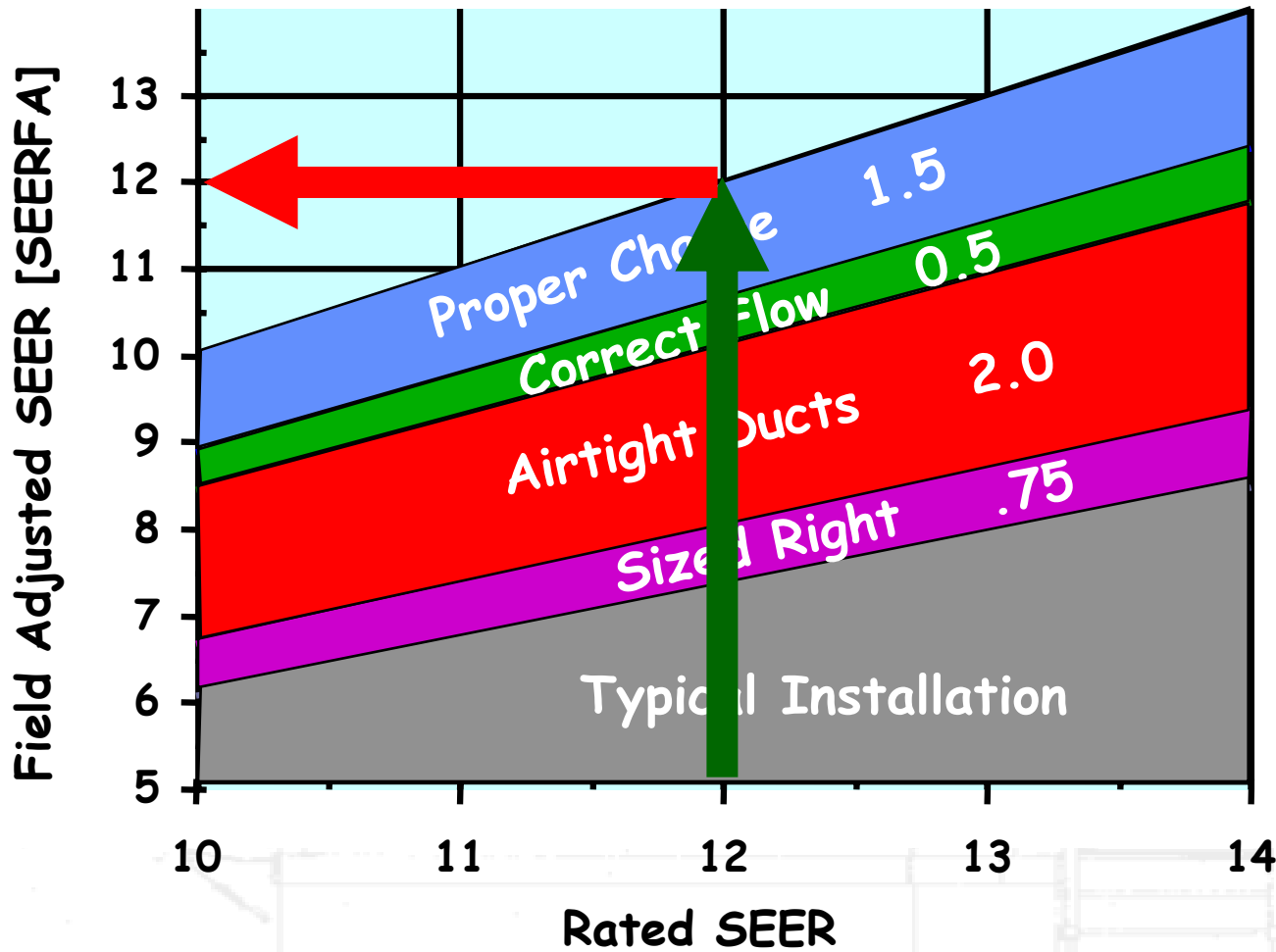


ENERGY STAR



Courtesy of Advanced Energy Corp.

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: IMPACT OF INSTALLATION FACTORS



Courtesy of Advanced Energy Corp.

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: IAQ REASONABLE COST ANALYSIS



	Monthly Cost/Savings/Value	
	Advanced Bldr.	Progressive Bldr.
Incremental Cost	(\$11)	(\$21)
Added Energy Savings	\$13	\$13
Est. Insurance Savings	\$8	\$8
Positive Cash-Flow	~\$10	~\$0

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: IAQ CONSUMER MESSAGE



< \$.75/day provides your family:

- *Over 100,000 cf of fresh, filtered outdoor air*
- *Additional protection against:*
 - *mold and mildew problems*
 - *radon exposure*
 - *harmful pests and termites*
 - *harmful formaldehyde and VOCs*
 - *combustion safety*
 - *wet basements*

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: IAQ BUILDER MESSAGE



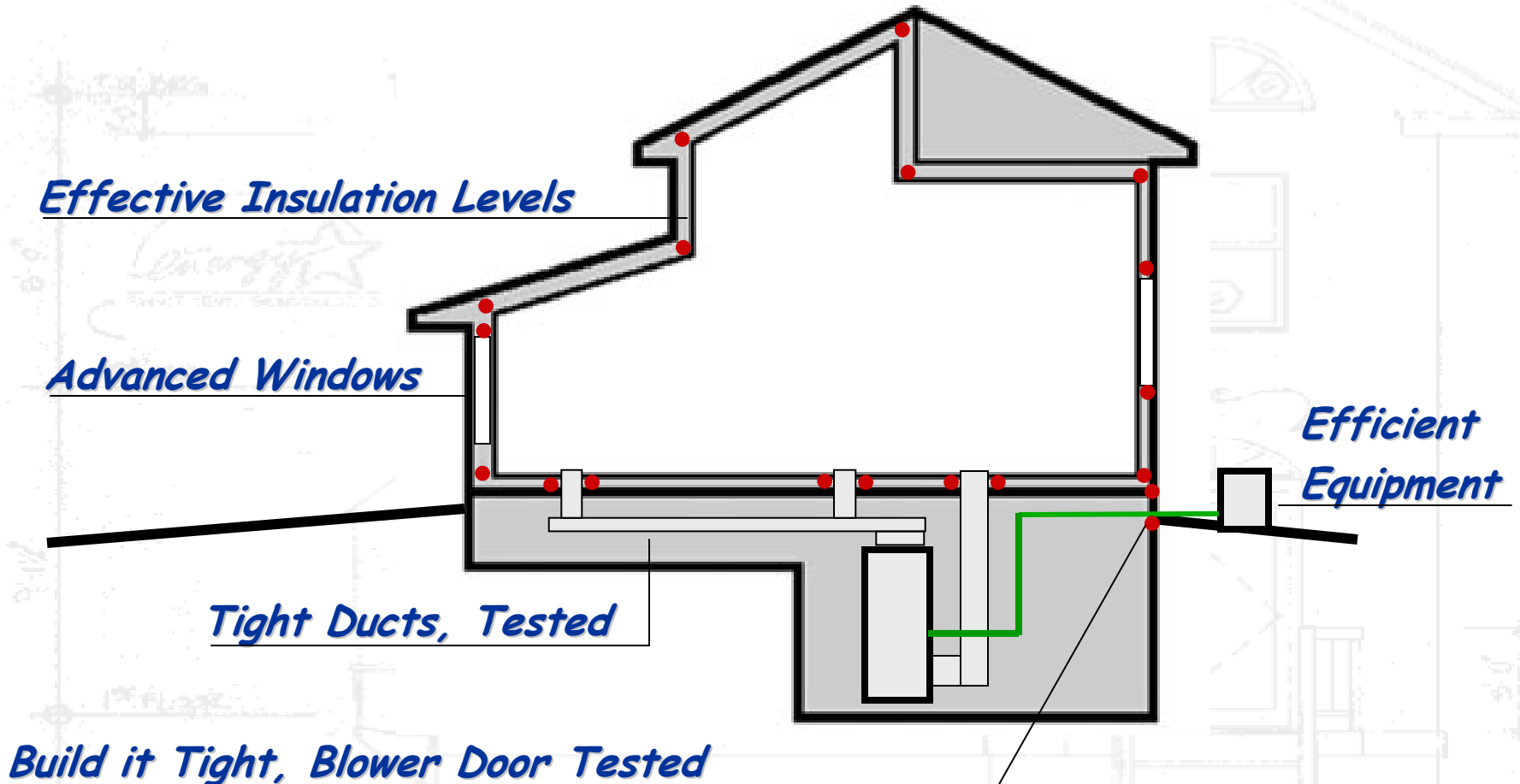
- *Meet Growing Buyer Preference*
- *Increase Revenues*
- *Reduce Liability/Risk*

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: IAQ LABEL SCHEDULE



- ***Complete Final Spec***
12/04
- ***Start HERS Industry Coordination***
1/05
- ***Launch Pilot***
1/05 (e.g., 3 test markets)
- ***Negotiate Rates with Insurance Industry***
1/05 - 1/06
- ***Evaluate Pilot***
1/05 - 1/06
- ***Modify/Expand Program***
1/06

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: SUMMARY: ENERGY STAR NOW...



ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: SUMMARY: NEW THRESHOLD



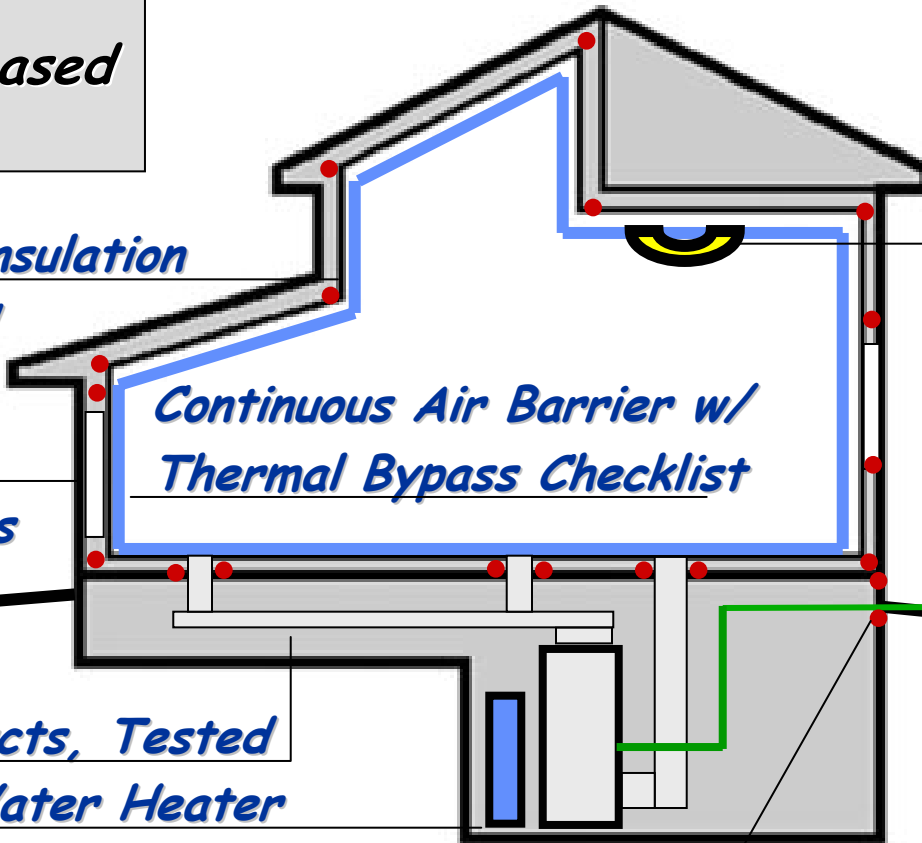
or, equivalent performance-based measures

IECC or Better Insulation Properly Installed

ENERGY STAR Qualified Windows

Tight Ducts, Tested Efficient Water Heater

Build it Tight with Blower Door Test and Thermal Bypass Checklist



Continuous Air Barrier w/ Thermal Bypass Checklist

ENERGY STAR Qualified Lighting, Fans, or Appliances

Right-Sized ENERGY STAR HVAC Equip.

ENERGY STAR QUALIFIED HOMES INCREASED BASELINE: SUMMARY: NEW IAQ LABEL



- Moisture control
- Radon Control
- Pest Control
- HVAC Systems
- Combustion Safety
- Materials

IECC or better
Insulation Properly
Installed

Drainage Plane

Radon Vent

Screens/Shield

Right-Sized
ES Equip.

Water Proofing

Drain Tile

Safe/Protected Mat.
ES Qualified Windows

Slope Grade

Direct/Power Vent

Tight D

Water/

Efficient Wa

Build it Tight, Ventilate