

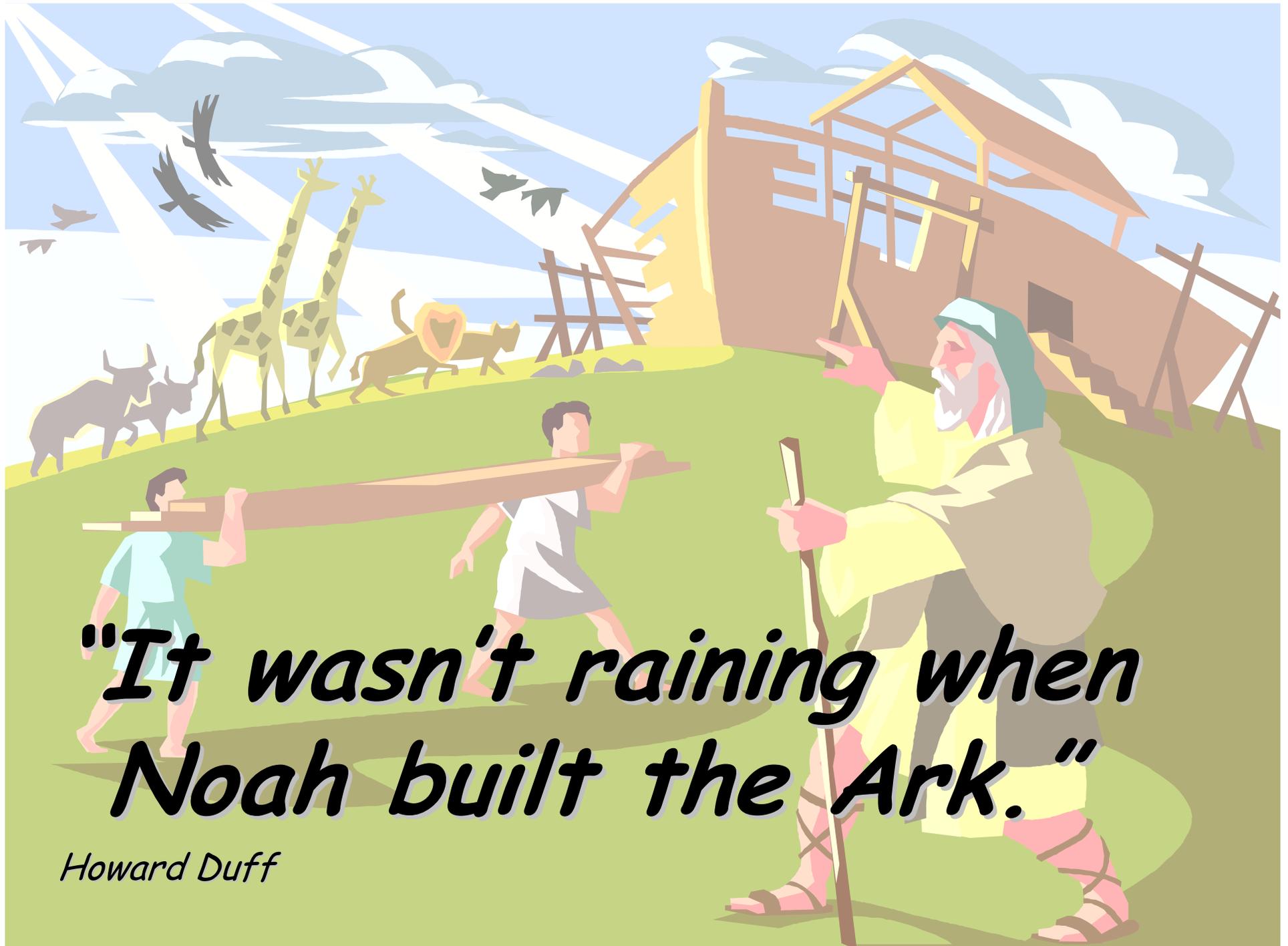
NATIONAL BUILDING CODES WORKSHOP  
AUGUST 2, 2006



# *Why Beyond Code?*

*The ENERGY STAR Perspective*

- *Why Beyond the Energy Code?*
- *How About ENERGY STAR?*
- *Why/How is it Changing?*



***"It wasn't raining when  
Noah built the Ark."***

*Howard Duff*

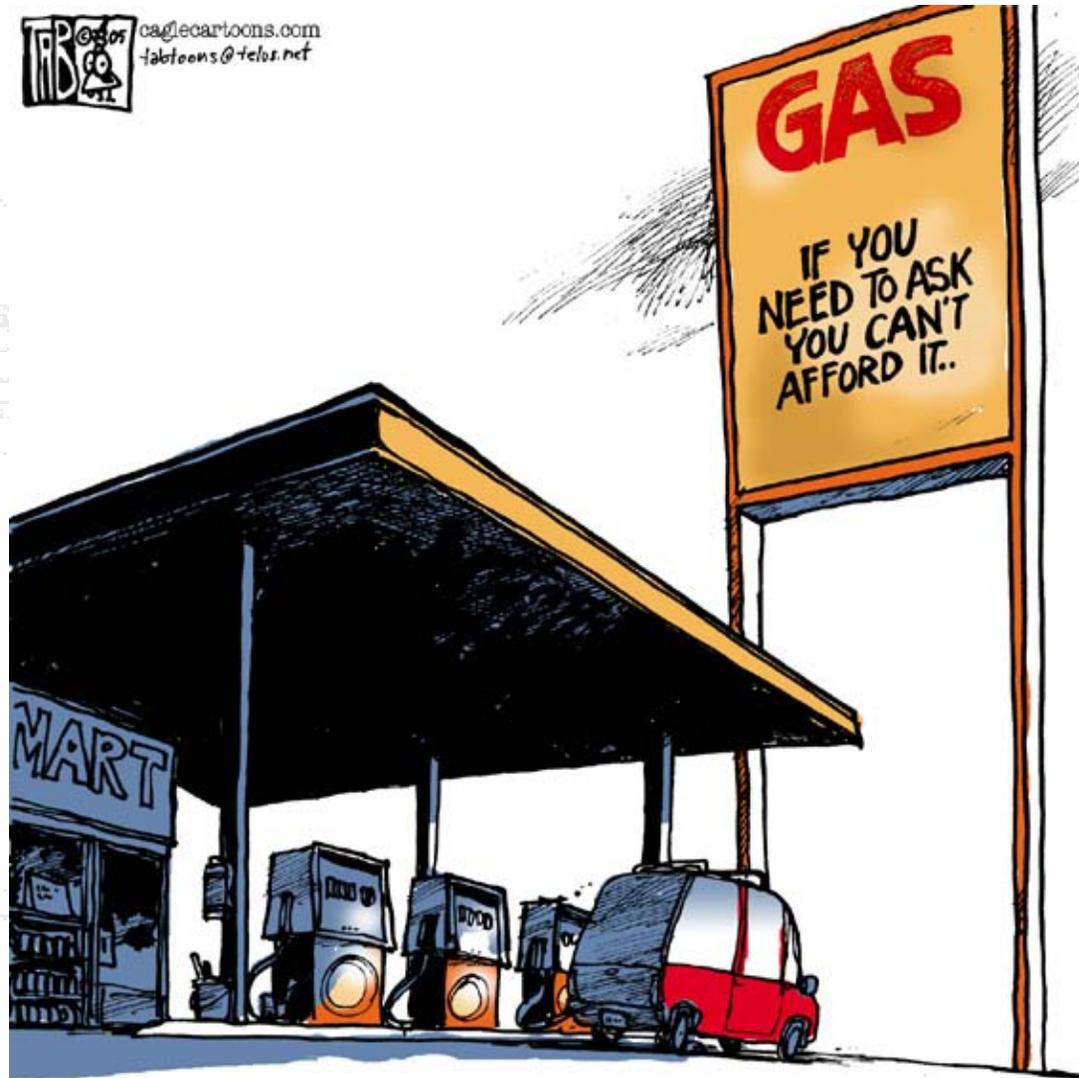
# *What Storm?*



# APPROACHING STORM? ENERGY COSTS



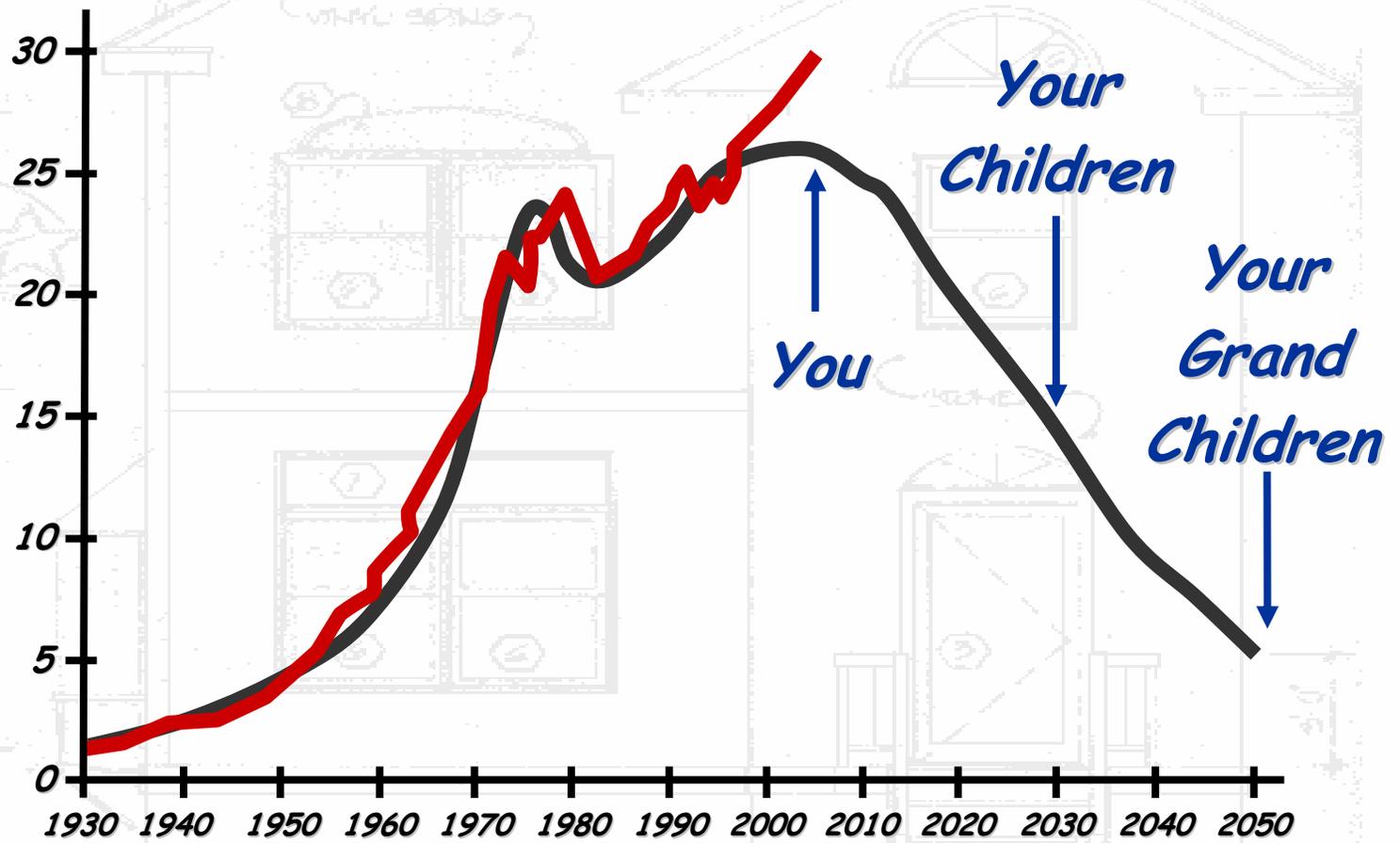
ca@ecartoons.com  
-tabtoons@telus.net



# APPROACHING STORM? PEAK OIL RAPIDLY APPROACHING



*Annual World  
Oil Production  
(Billions Barrels)*

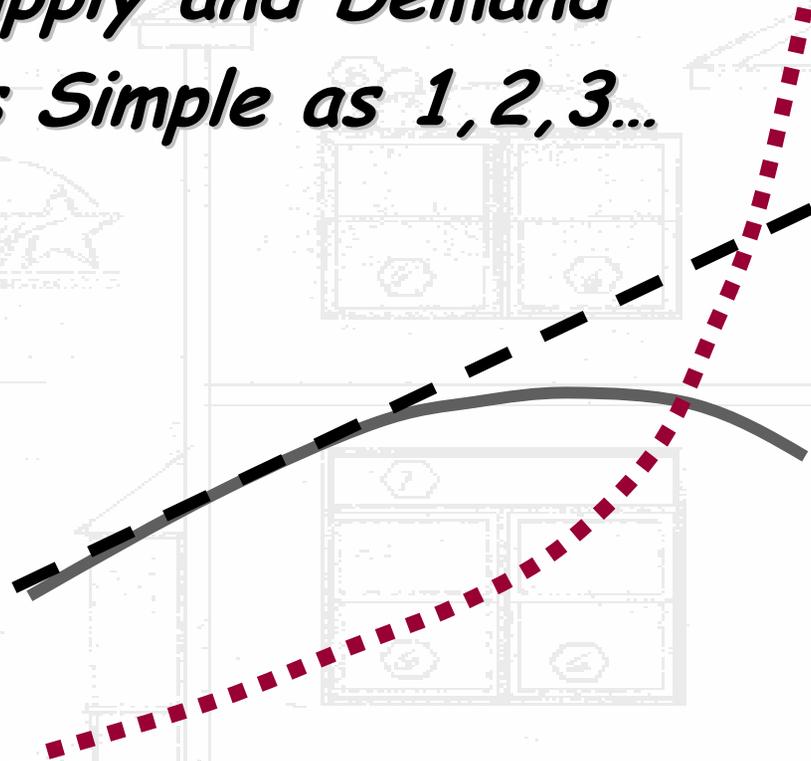


APPROACHING STORM?

# A SIGNIFICANT LIQUID FUELS CRISIS



*Supply and Demand  
As Simple as 1, 2, 3...*



**3. Price**  
(sky rockets)

**2. Demand  
Increases**  
(healthy world economy)

**1. Production**  
(supply declines)

*...and, there is no plan 'B'*

# APPROACHING STORM? CHANGING CONSUMER PREFERENCES



## Small Cars in Focus As Gas Prices Rise

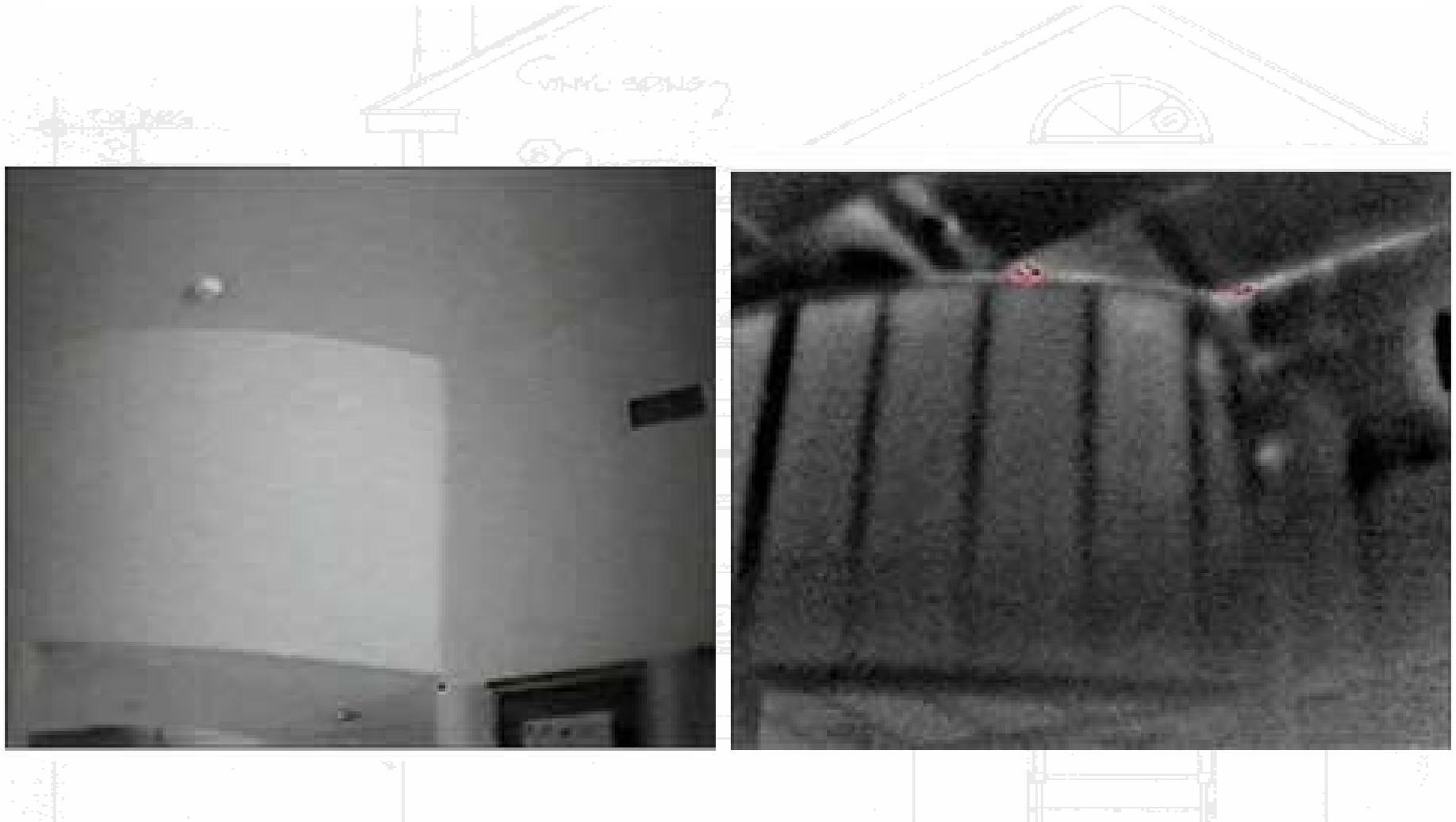
By MATT MOORE  
The Associated Press  
Tuesday, September  
13, 2005; 11:52 AM  
Power Information  
Network expects the  
number of compacts  
and sub-compacts on  
the U.S. market grow  
to grow from 33 this  
year to 40 in 2010.



# APPROACHING STORM? INCREASED BUILDING DIAGNOSTICS



# APPROACHING STORM? DEFECTS NO LONGER HIDDEN



# APPROACHING STORM? LOW COST INFRARED CAMERAS



## Panasonic

AW-E650 1/2-Inch 3-CCD Convertible System Camera with Extreme Low-Light Sensitivity, Built-In Filters and Infrared Total Darkness Vision [More Info](#)

Mfr # AWE650 • B&H # PAAWE650

**Availability :** [Accepting Orders](#)

**Price : \$ 4,099.95**

[Shipping Cost](#)

Quantity

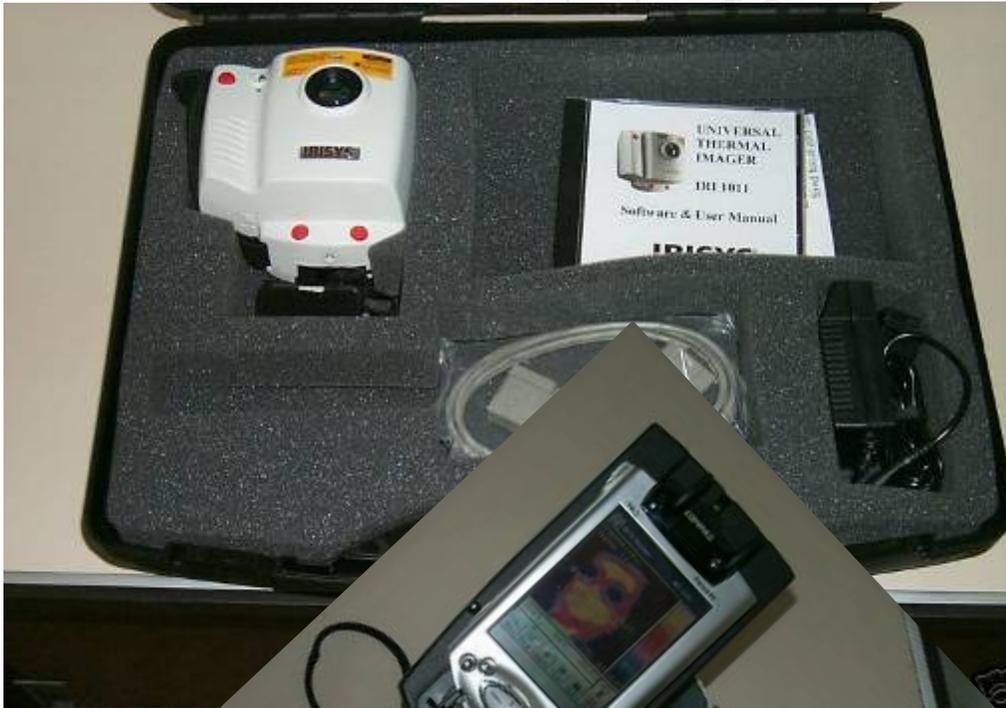


[Add to Cart](#)

[Add to Wishlist](#)



# APPROACHING STORM? LOW COST INFRARED CAMERAS



**The IRISYS**

**Buy Now**

**\$2000.00**

# APPROACHING STORM? QUALITY ACCOUNTABILITY



## *JD Powers and Assoc. 2005 Builder Quality Rankings*

Market	2005		
<b>Major Market Total</b>	<b>112</b>		Raleigh/Durham 113
			Seattle/Tacoma 113
 Austin	122	 Denver/Colorado Springs	111
 Orange County (CA)**	122	 San Diego	111
 Sacramento	120	 San Francisco Bay Area	111
 Houston	118	 Portland*	109
 Tucson	118		Atlanta 108
 Dallas/Ft. Worth	117	 Detroit	108
 Los Angeles/Ventura Counties**	116		Ft. Myers/Naples 108
 Minneapolis	116		Palm Beach 107
 Charlotte	115	 Baltimore*	106
 Chicago	115		Albuquerque* 104
 Tampa	115	 Orlando	104
 Phoenix	114	 Washington, D.C.	104
 Inland Empire (CA)**	113	 Philadelphia	101
 Las Vegas	113		Jacksonville 98

# APPROACHING STORM? QUALITY COMPETITIVENESS



[ABOUT US](#) | [INVESTOR RELATIONS](#) | [PRESS ROOM](#) | [CAREERS](#) | [CONTACT](#) | [DEL WEBB](#) | [DIVOSTA HOMES](#)

[SEARCH FOR YOUR HOME](#) [ESPAÑOL](#)



PULTE HOMEOWNER FOR LIFE™

[GETTING STARTED](#) | [FIND YOUR HOME](#) | [PERSONALIZE YOUR HOME](#) | [FINANCE YOUR HOME](#) | [BUILDING YOUR HOME](#) | [LIVING IN YOUR HOME](#)

Highest in  
Customer  
Satisfaction

GO



**PULTE HOMES**  
Come and  
visit us today.



## Find Your Home

Where do you want to live?

Select a state to begin  
your search.

SELECT STATE:

--- Select State ---



## Ready to Move

Sign up to receive  
email updates on  
available homes.

GO

APPROACHING STORM?  
SMARTER CONSUMERS



**~80%**

*of New Homes Buyers use the Web  
before purchasing a new home*

APPROACHING STORM?  
INCREASED LIABILITY



***Liability insurance is  
scarce and expensive***

***"If you deliver a safe, durable and efficient  
home, you typically won't be sued."***

*Stan Luhr, Risk Auditor*

# APPROACHING STORM? LEADERSHIP ACCOUNTABILITY



MIKE LUCKOVICH  
ARTIST: JIMMY GIBSON  
© 2006

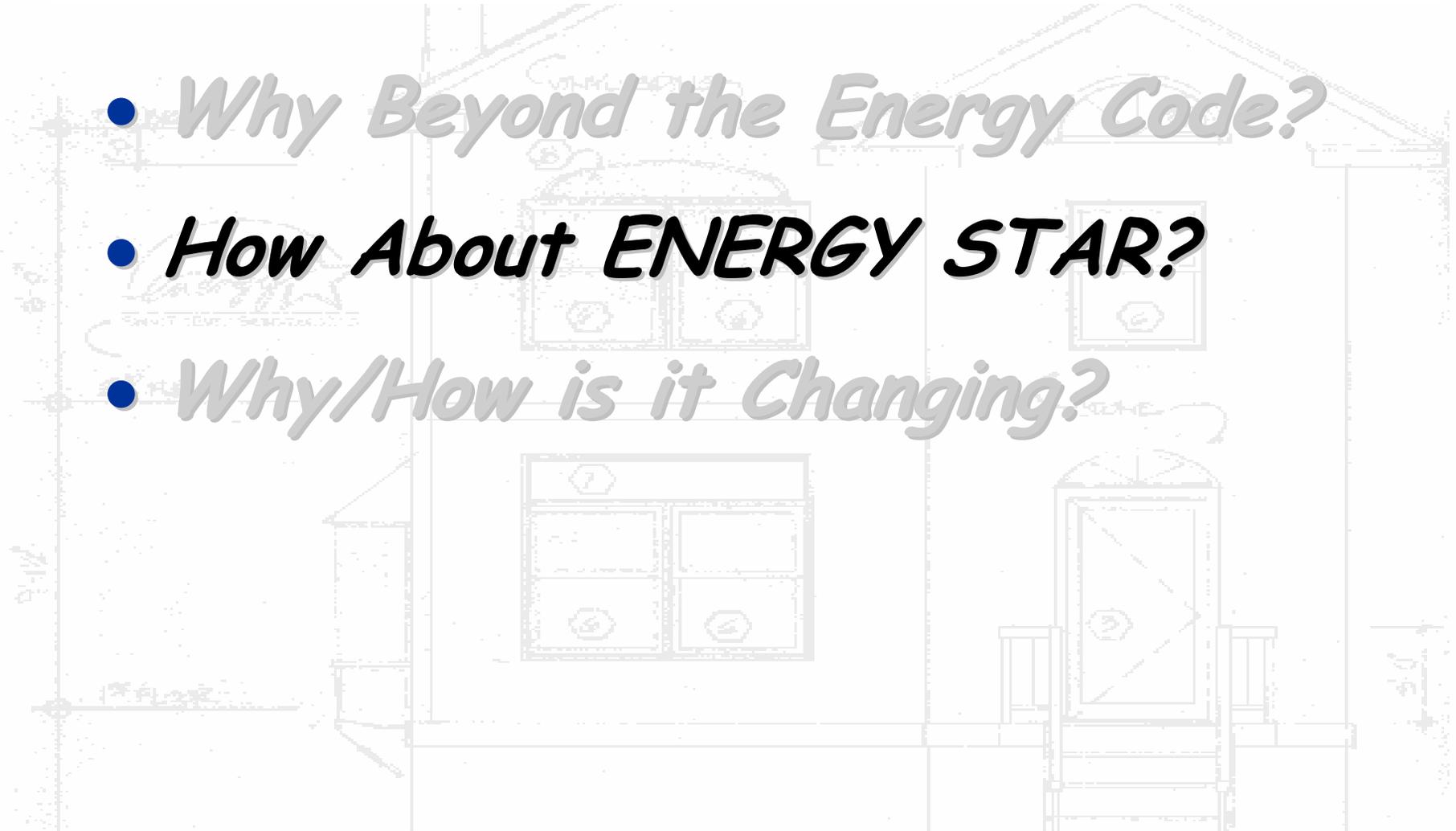


THELMA & LOUISE

# ENERGY STAR FOR HOMES OUTLINE



- *Why Beyond the Energy Code?*
- **How About ENERGY STAR?**
- *Why/How is it Changing?*



WHAT IS ENERGY STAR?  
SUCCESSFUL 'BRAND'

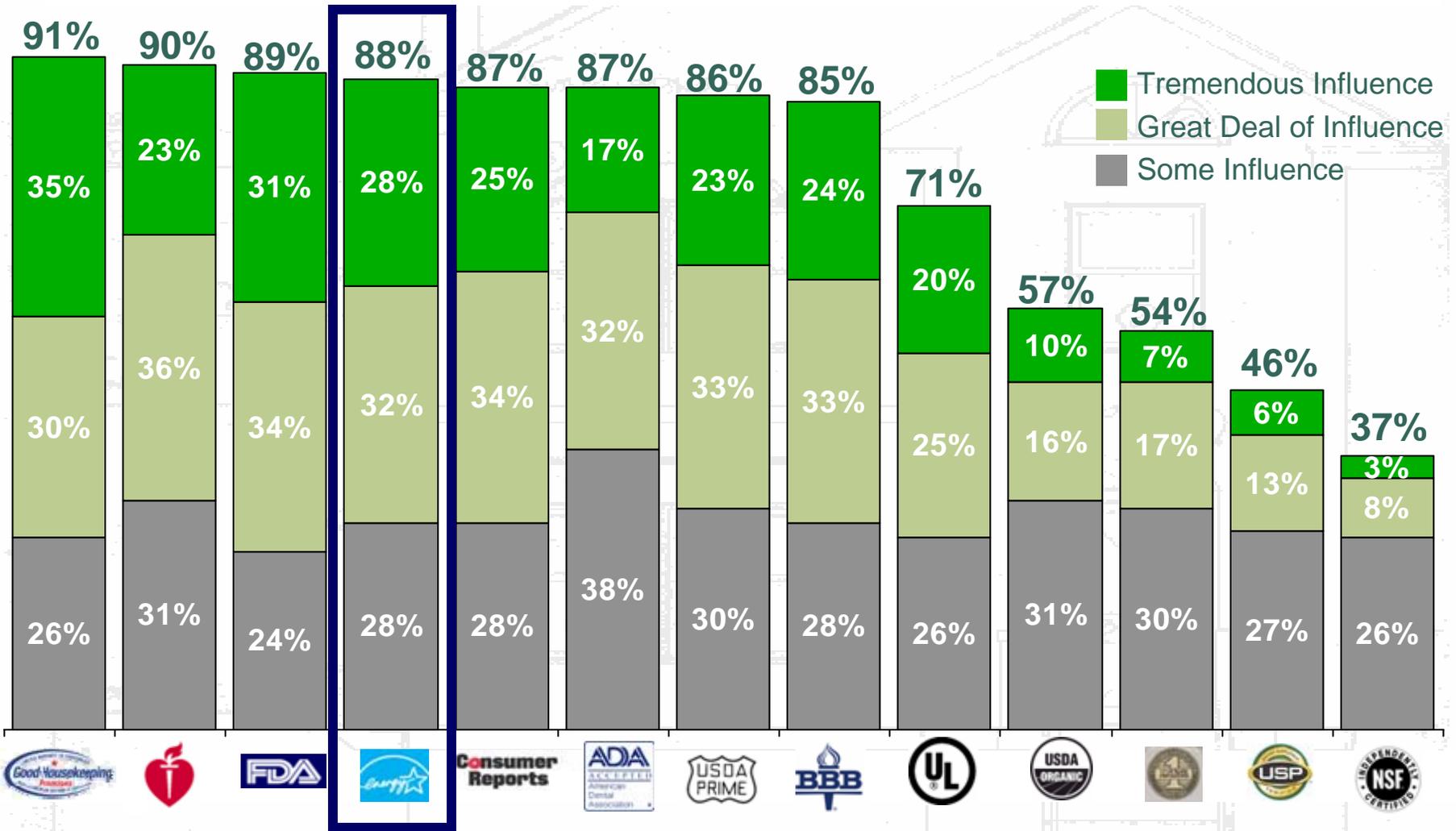


**60%+** *awareness in 2004*

**70%+** *households would recommend*

**95%** *likely to buy again in future*

# WHAT IS ENERGY STAR? SUCCESSFUL 'BRAND'



Source: Fairfield Research, May 2003

WHAT IS ENERGY STAR?  
CONSISTENT 'BRAND' PROMISE



*The national, US government-backed  
**symbol for  
energy efficiency**  
while assuring same or better performance*

# WHAT IS ENERGY STAR? KEY CONCEPTS FOR HOMES



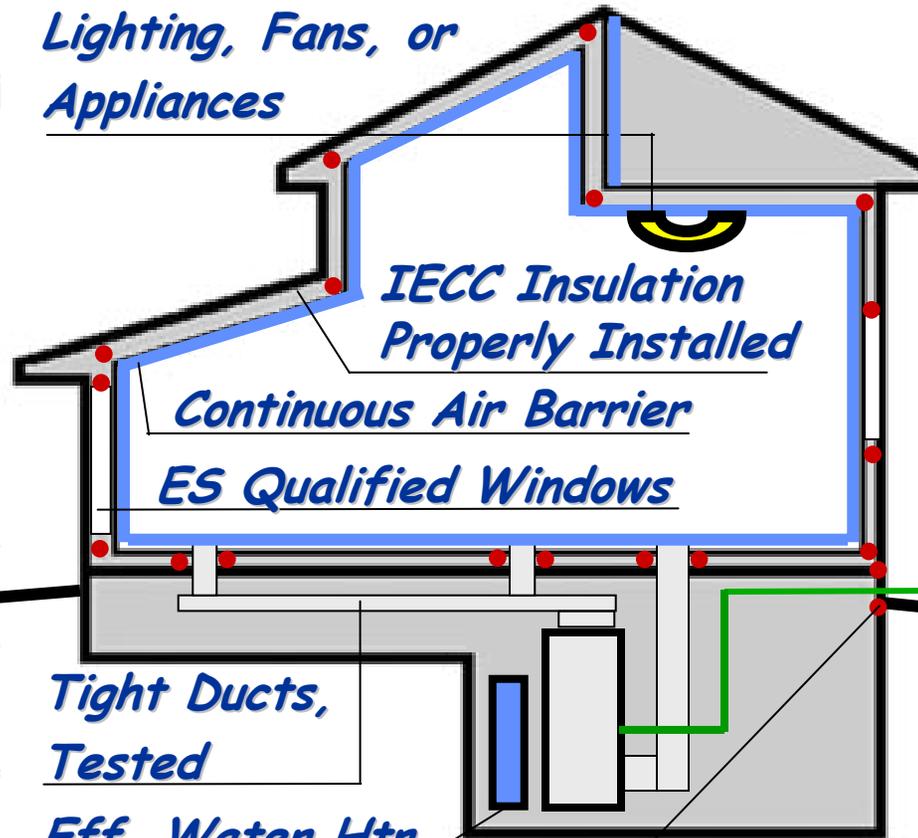
- ***Voluntary***
- ***Target Mainstream Builders/Buyers***
- ***Define Truly Energy Efficient***
- ***Focus on Builder Recognition***
  - Third-Party Verified*
  - Government-Backed Label*
  - Marketing Tools/Awards*

# WHAT IS ENERGY STAR? DEFINING TRULY EFFICIENT HOMES



*HERS Index:  
85 in South;  
80 in North,  
or equivalent  
package...*

*ENERGY STAR Qualified  
Lighting, Fans, or  
Appliances*



*IECC Insulation  
Properly Installed*

*Continuous Air Barrier*

*ES Qualified Windows*

*Right-Sized  
ES Equip.*

*Tight Ducts,  
Tested*

*Eff. Water Htr.*

*Build it Tight, Tested*

*Plus...  
Third-Party  
Verification*

WHAT IS ENERGY STAR?  
DEFINING TRULY EFFICIENT HOMES



***"Our subcontractors send their best crews because they know their work will be inspected."***

*ENERGY STAR Partner Astoria Homes, Nevada*

# WHAT IS ENERGY STAR? BUILDER RECOGNITION



- *Logo/Label*
- *Web Site Listing*
- *100% Commitment*
- *Awards*
- *Outreach Campaign*
- *Sales ToolKit*

Address:

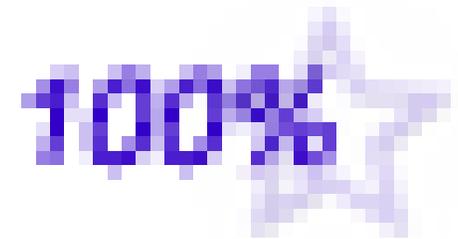
Built by:

Verified by:

Date:

Optional information:

This home has been independently verified to meet ENERGY STAR guidelines for energy efficiency. Each ENERGY STAR qualified home is built to meet or exceed the EPA-approved sampling protocol to meet ENERGY STAR guidelines for energy efficiency. Each ENERGY STAR qualified home is built to meet or exceed the EPA-approved sampling protocol to meet ENERGY STAR guidelines for energy efficiency.



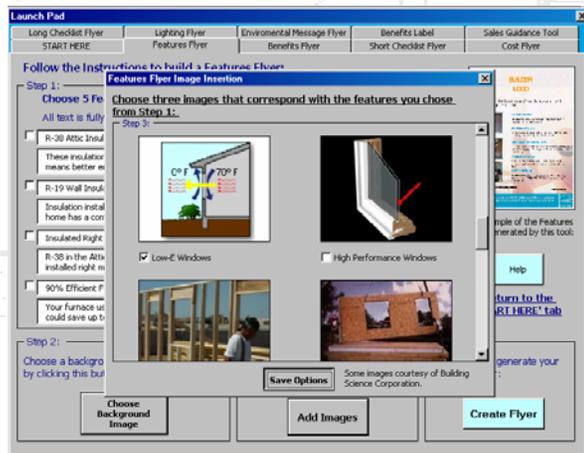
THESE BUILDERS DON'T JUST SEE A FUTURE HOME. THEY SEE A BETTER FUTURE.

Ashion Woods Homes	Guatapa Custom Homes
Atlanta Luxury Homes	Habitat for Humanity
Beazer Homes	Hacienda Builders
Continental Homes	Hallcraft Homes
Elite Homes	Keystone Homes
Engle Homes	Maximum Homes
Environmental Homes	Royce Builders
Golden Heritage	Schuler Homes

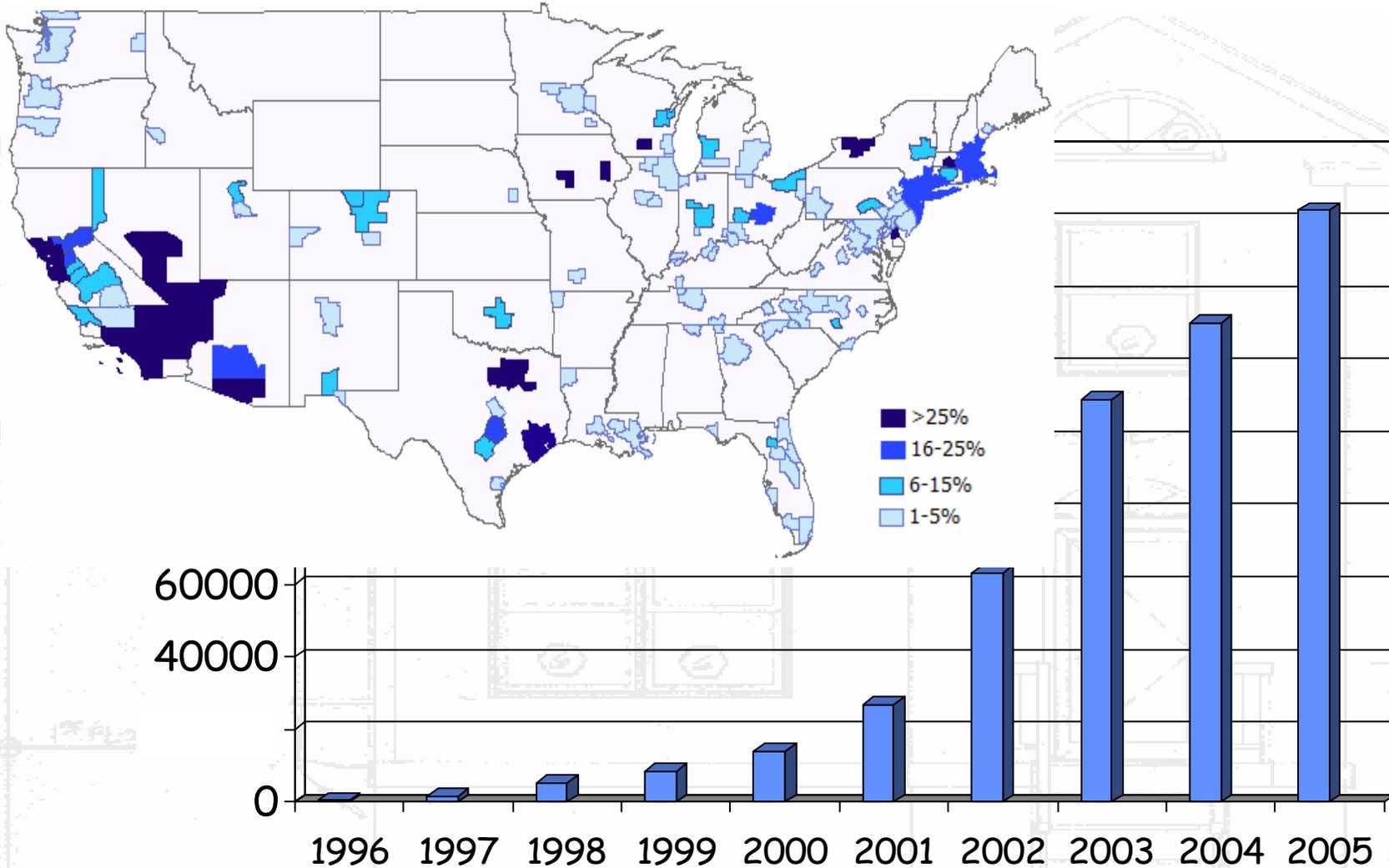
Visit them at [www.arizonaenergystarhomes.com](http://www.arizonaenergystarhomes.com)

BUY AN ENERGY STAR QUALIFIED HOME. IT'S BETTER FOR YOU AND THE ENVIRONMENT.

ENERGY STAR qualified homes meet EPA's strict guidelines for energy efficiency. These homes provide greater comfort and durability while lowering utility costs. Energy efficiency also protects the environment by significantly reducing the greenhouse gas emissions that contribute to global warming. Learn more. Visit [www.energystar.gov](http://www.energystar.gov)



# WHAT IS ENERGY STAR? SUSTAINED GROWTH



WHAT IS ENERGY STAR FOR HOMES?

## KEY METRICS FOR HOMES' SUCCESS

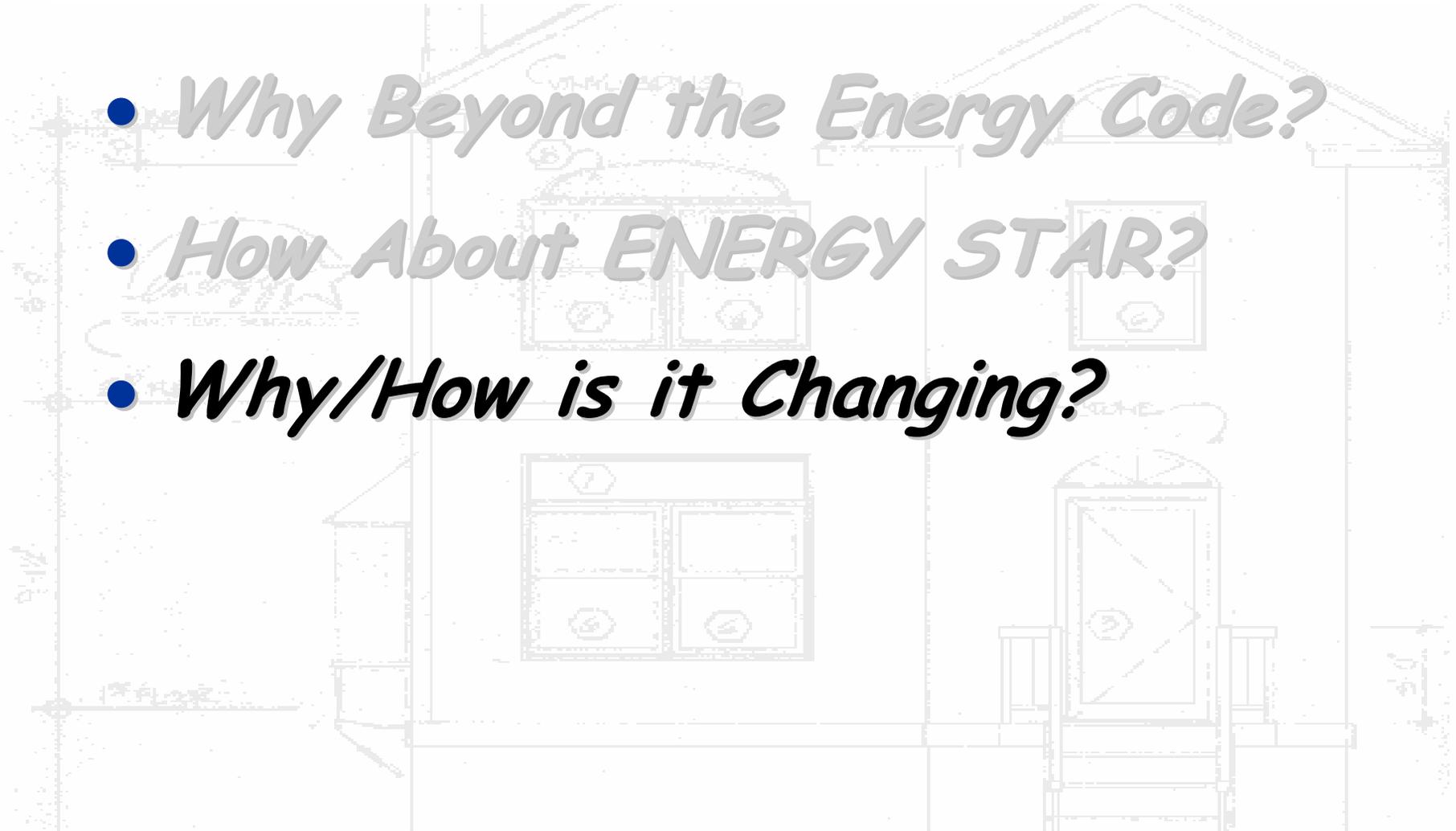


- ***600,000+ Labeled Homes Cum.***
- ***~15-60% Market Penetration***
- ***3,000+ Builder Partners***
- ***60%+ 100 Largest Builders***

# ENERGY STAR FOR HOMES OUTLINE



- *Why Beyond the Energy Code?*
- *How About ENERGY STAR?*
- *Why/How is it Changing?*

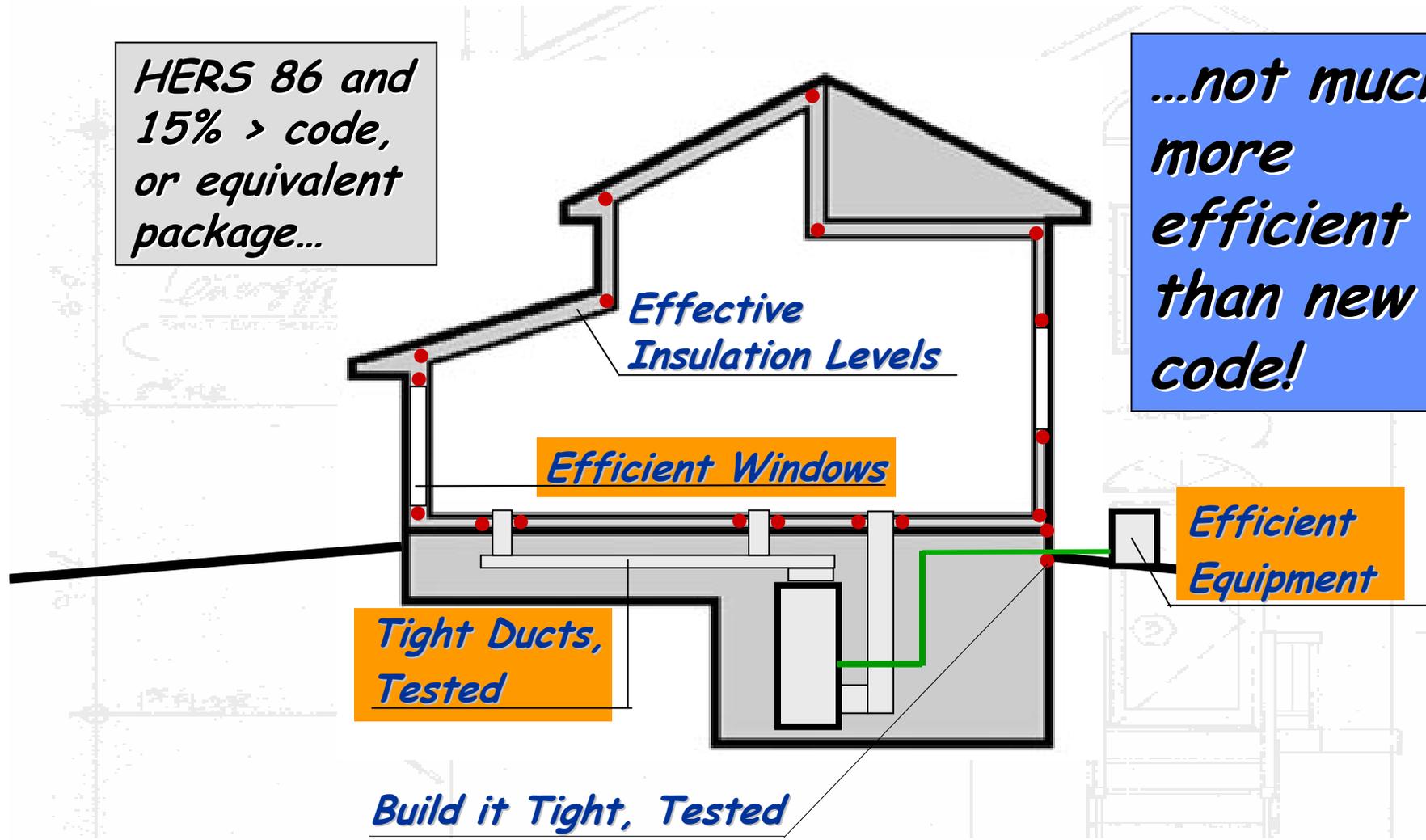


WHY IS IT CHANGING?  
WHAT OLD SPEC DELIVERED...



*HERS 86 and  
15% > code,  
or equivalent  
package...*

*...not much  
more  
efficient  
than new  
code!*



*Tight Ducts,  
Tested*

*Efficient Windows*

*Efficient  
Equipment*

*Build it Tight, Tested*

WHY IS IT CHANGING?  
OLD SPEC FIELD OBSERVATIONS...



*Houston...  
We have a problem.*





Dropped ceiling  
insulated incorrectly

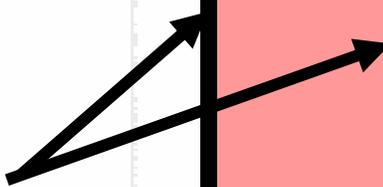
*Courtesy of Advanced Energy*

# WHY IS IT CHANGING? INSULATION MISUNDERSTOOD

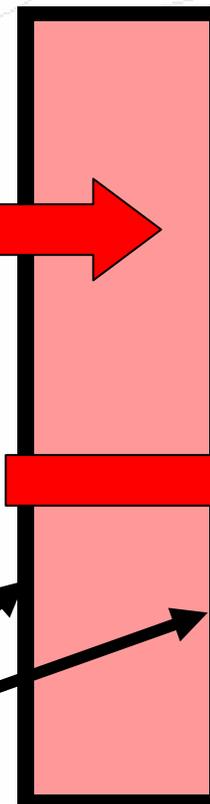


*Resists Heat Flow* 

*Air Flow* 

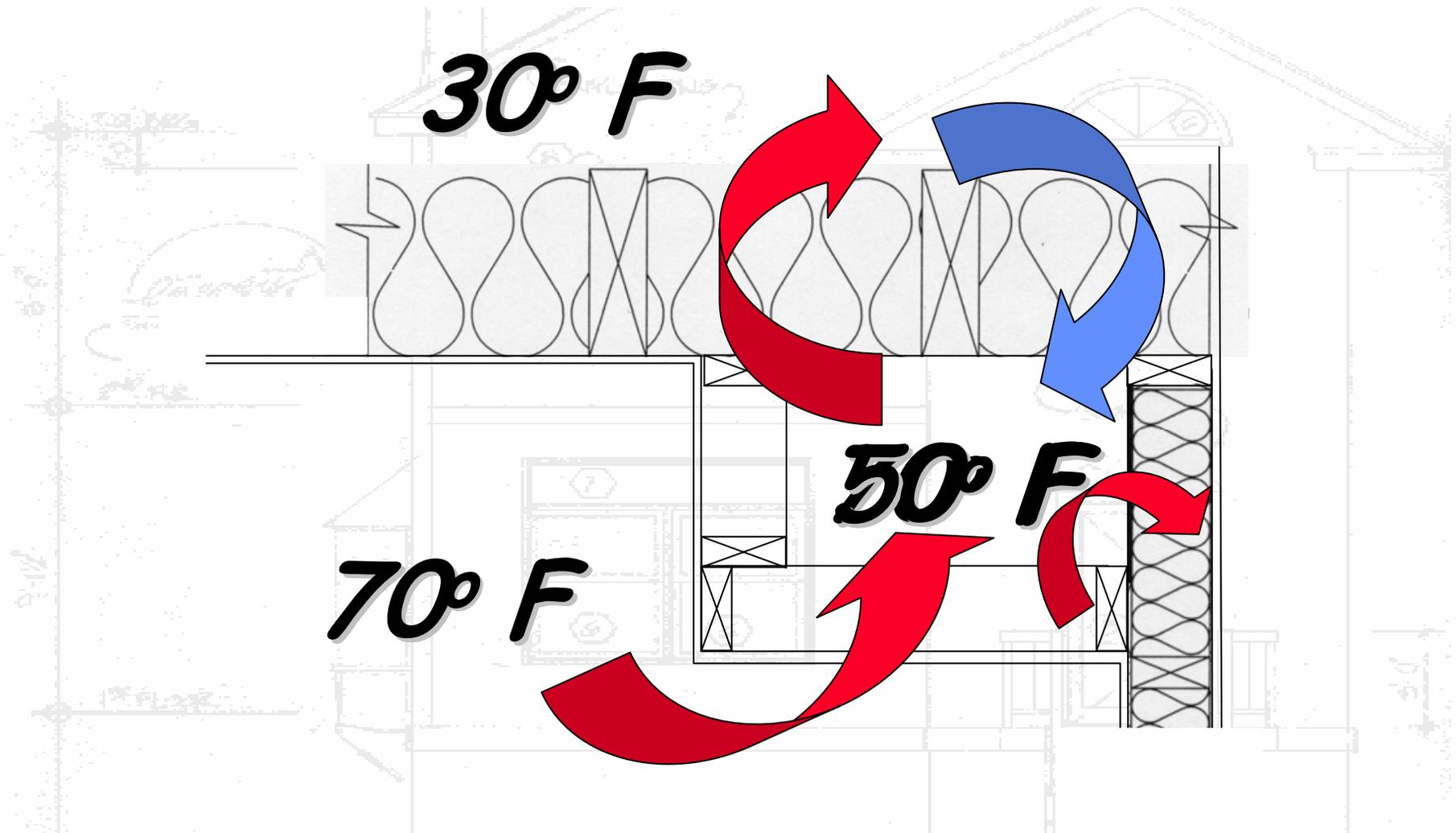
*...need Air Barrier* 

*any solid material that blocks air flow  
including sealing at edges and seams*



WHY IS IT CHANGING?

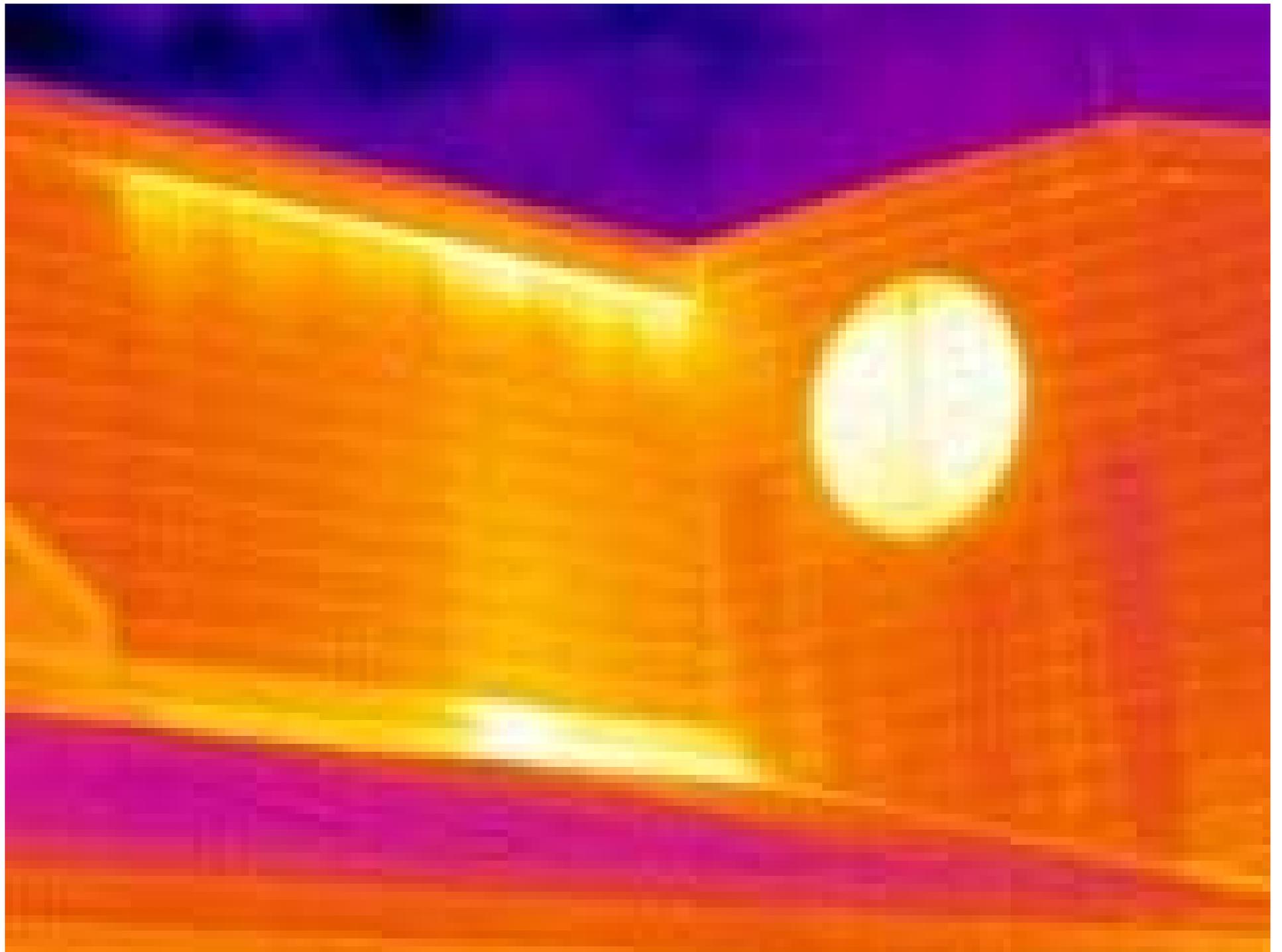
# HOW THERMAL BYPASS WORKS



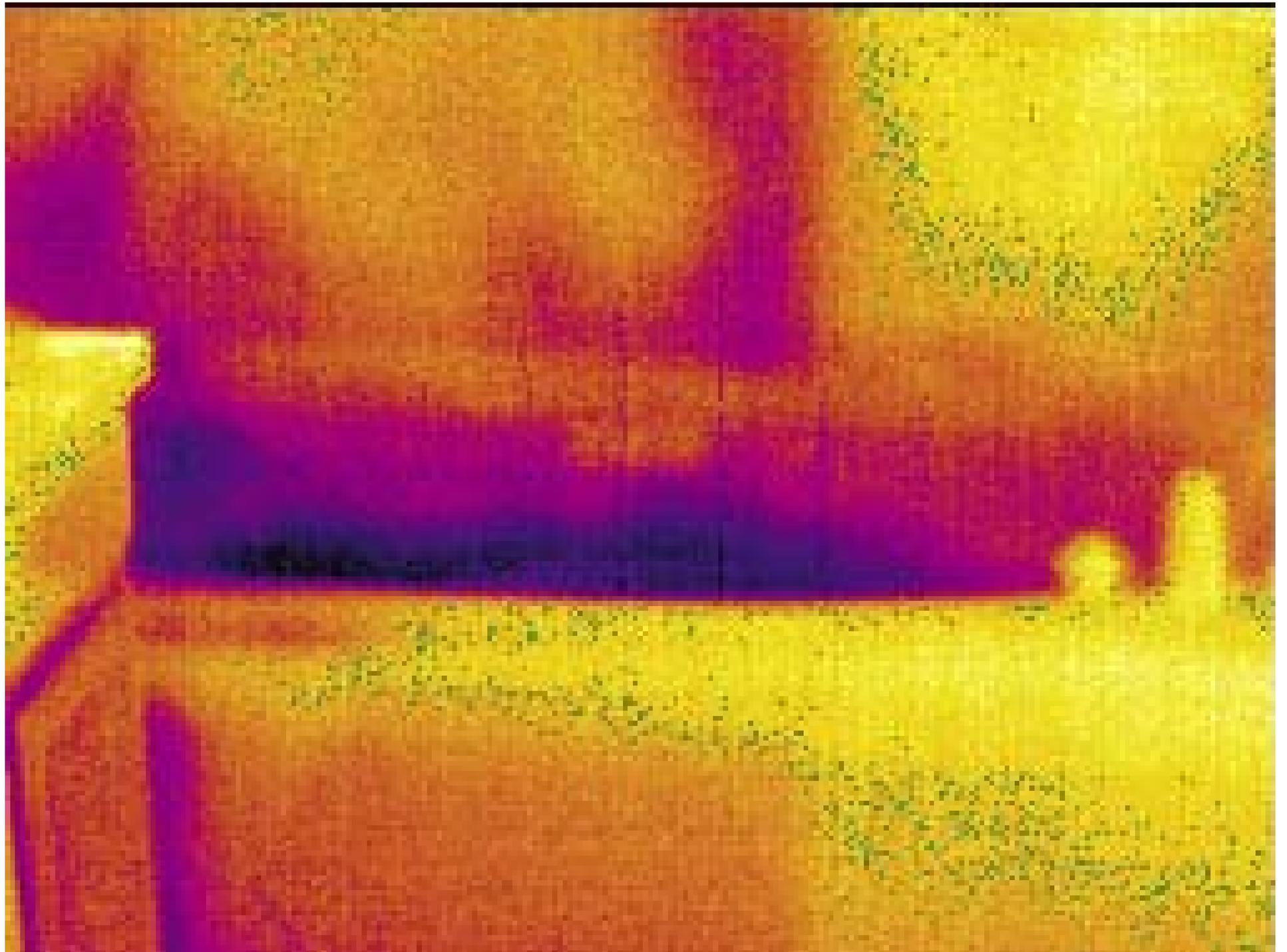








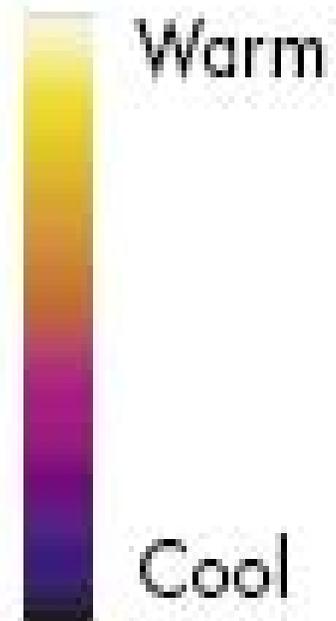
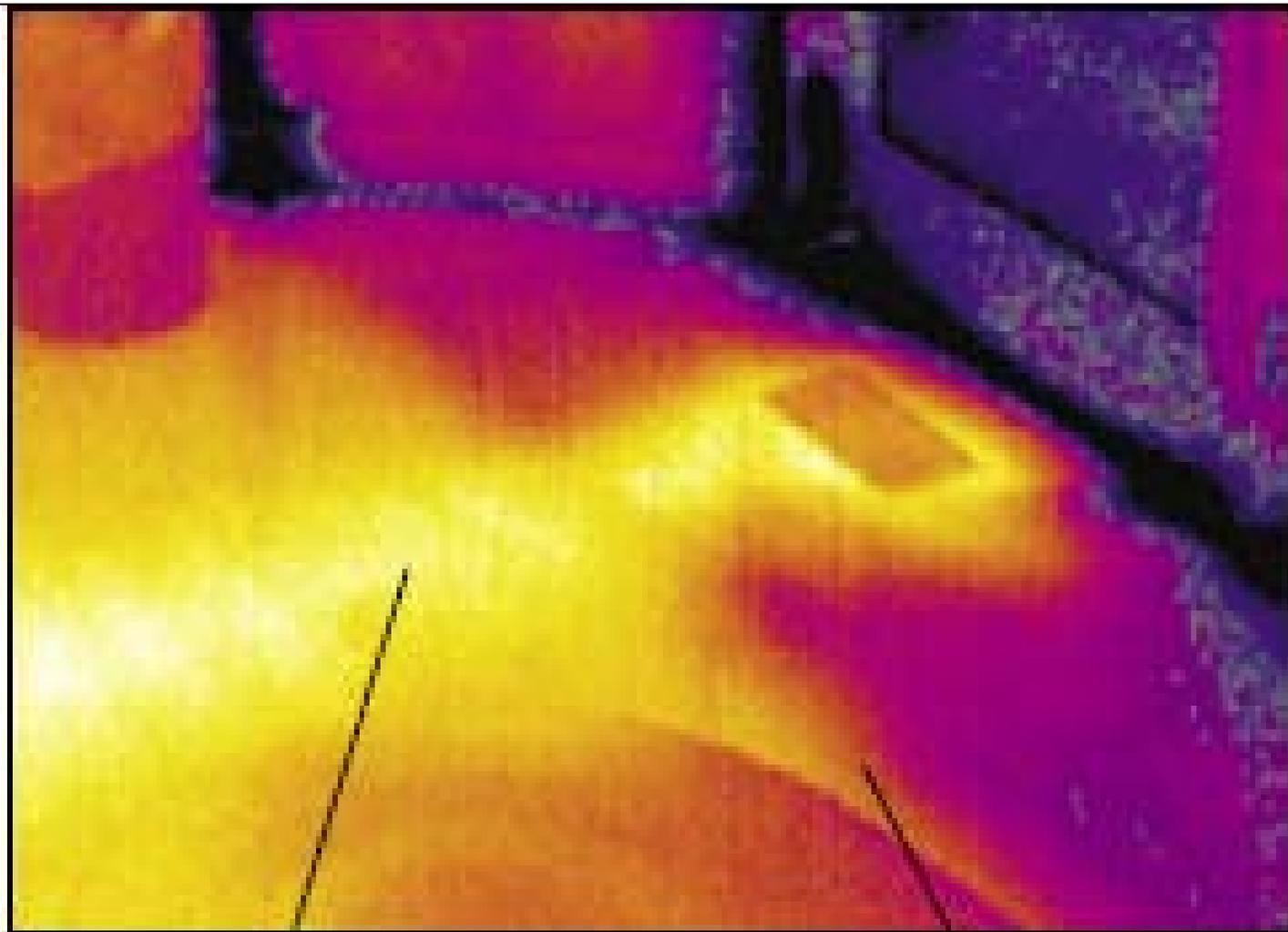






Cantilever  
needs blocking

*Courtesy of Advanced Energy*



Residual warmth  
from heat run

Cantilever boundary  
clearly visible



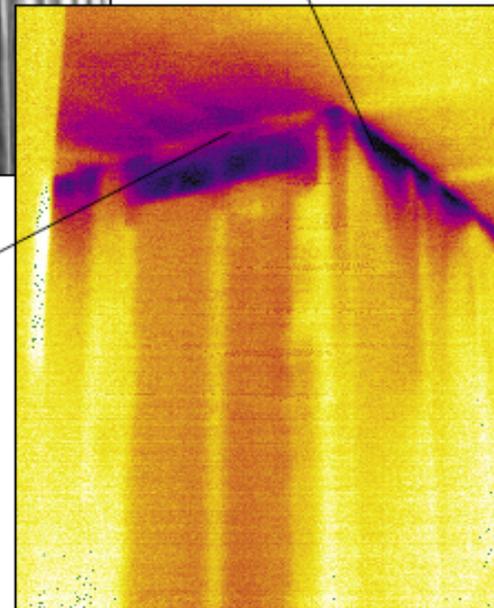
Insulation will not  
stop air flow

*Courtesy of Advanced Energy*

# WHY IS IT CHANGING? RETURN CAVITY AIR LEAKAGE



Air leaks through gaps between wallboard and framing. These gaps are skinny ( $1/16''$  to  $1/8''$  typical) but extend many lineal feet.



Blocking above return grille and wall cavity return was very leaky



*Courtesy of Fort Collins Utilities*



ThermaCAM™

+1 69.2 °F

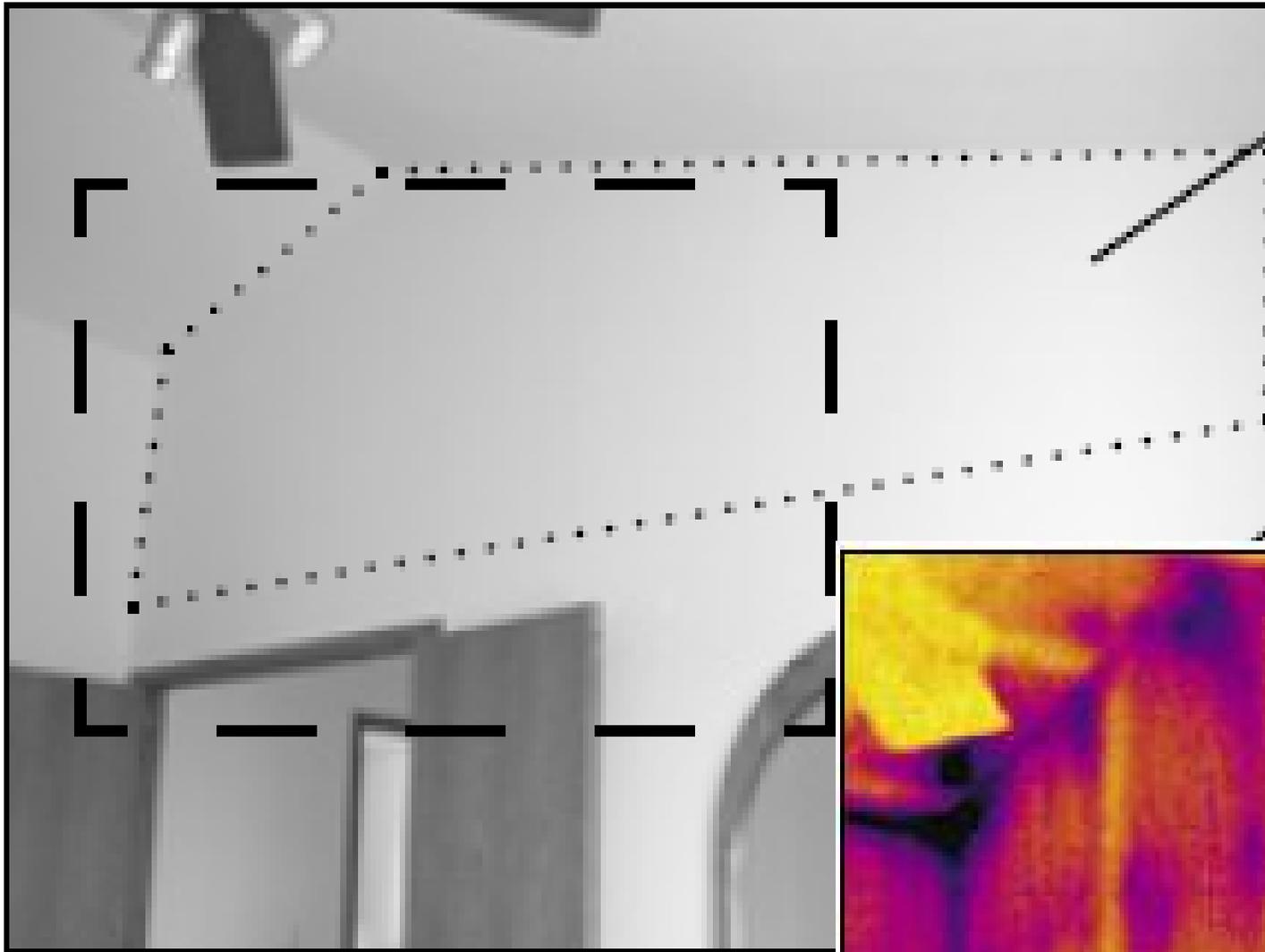
74



68

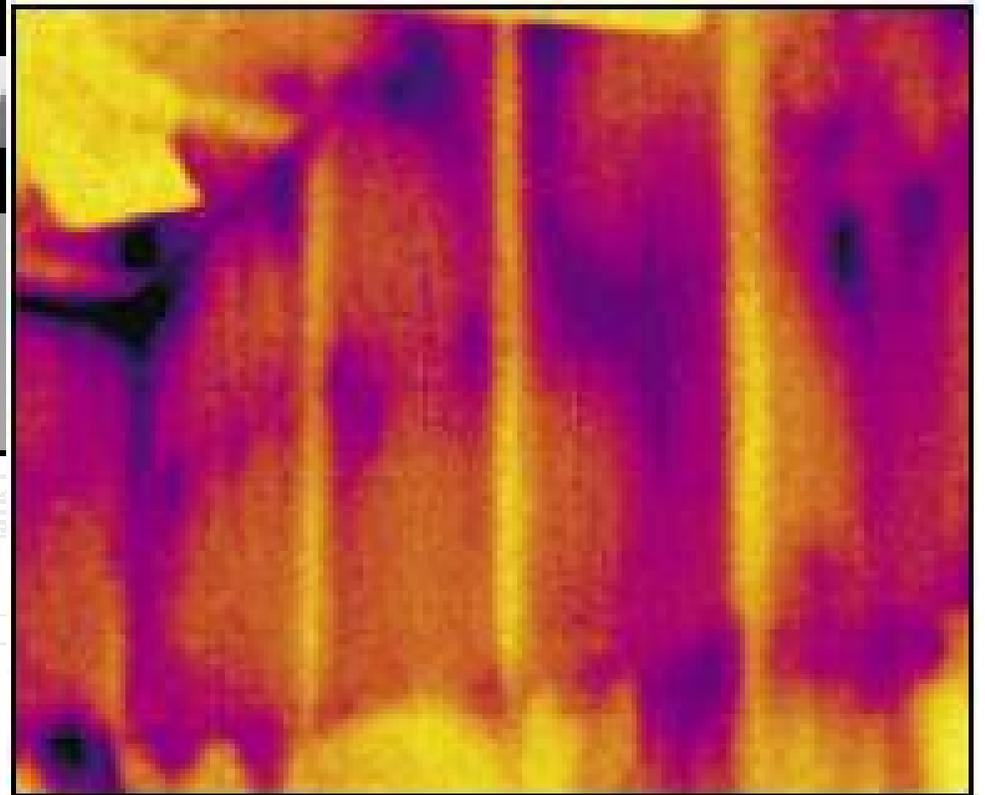
Trefl=68.0 Tatm=68.0 Dst=6.6 FOV 24

1/11/03 6.46.10 AM -40 - +250 e=0.96



Knee wall  
to attic  
space

Partition  
wall to  
another



*Courtesy of D.R. Wastchak*

WHY IS IT CHANGING?

# ADDRESS INSULATION VALUE KILLERS



- *Gaps*
- *Voids*
- *Compression*

*Insulation  
Installation  
Inspection*

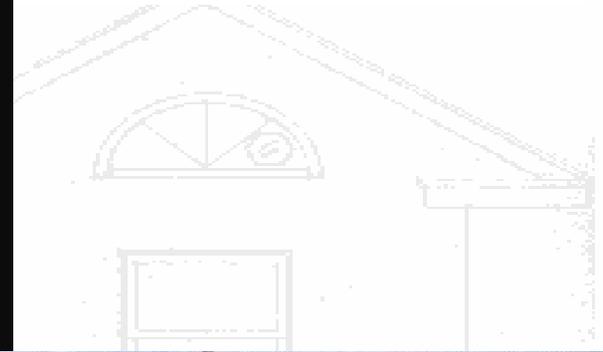
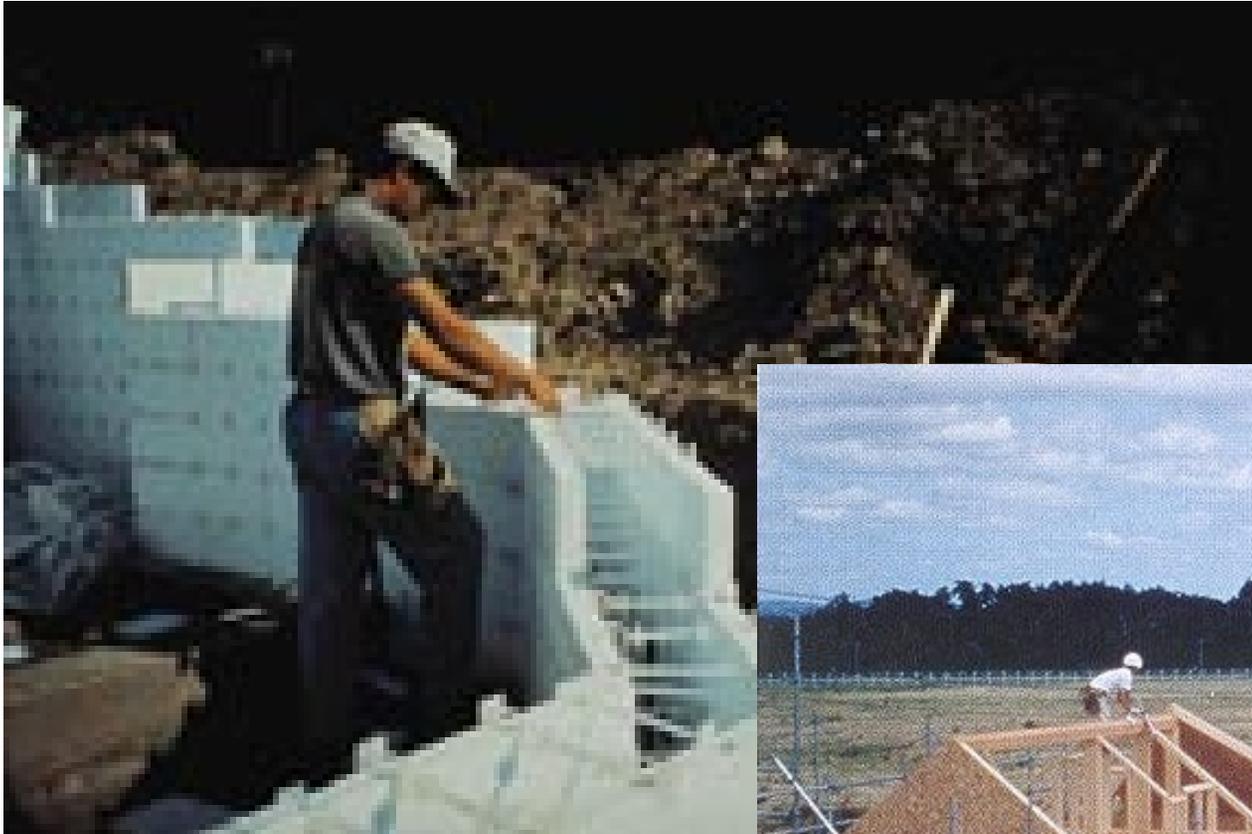
- *Incomplete Air Barrier*
- *Misalignment with Air Barrier*
- *Wind Intrusion*

*Thermal  
Bypass  
Checklist*

# WHY IS IT CHANGING? INSULATION INSTALLATION



# WHY IS IT CHANGING? INSULATION INSTALLATION



WHY IS IT CHANGING?

# TBC: SHOWER/TUB EXTERIOR WALL



# WHY IS IT CHANGING? TBC: ATTIC KNEE WALLS



*Hot Wall*

*Courtesy of Building Science Corp.*

WHY IS IT CHANGING?

# TBC: CANTILEVERED FLOORS



*Courtesy of Fort Collins Utilities*

WHY IS IT CHANGING?

## TBC: DUCT/PIPING PENETRATIONS

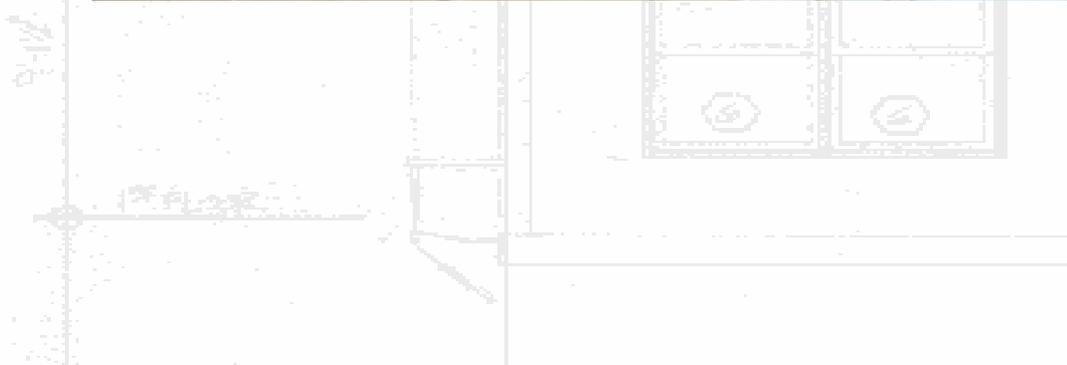


*Courtesy of Advanced Energy*

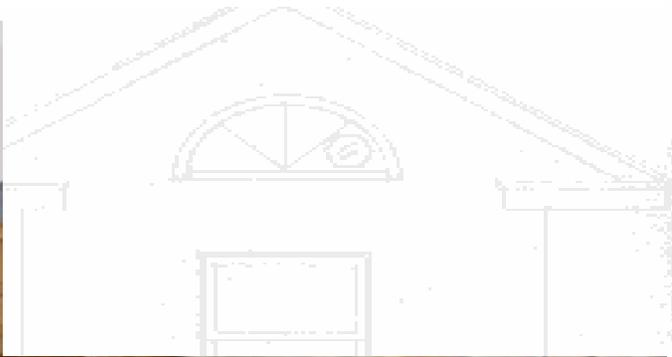
WHY IS IT CHANGING?  
TBC: FLUE SHAFT



# WHY IS IT CHANGING? TBC: ATTIC EAVES



# WHY IS IT CHANGING? TBC: DROPPED CEILINGS



*Courtesy of Building Science Corp.*

WHY IS IT CHANGING?

# TBC: FIREPLACE SHAFT WALL



*Courtesy of Building Science Corp.*

WHY IS IT CHANGING?  
ANSWER...



***Ensure:***

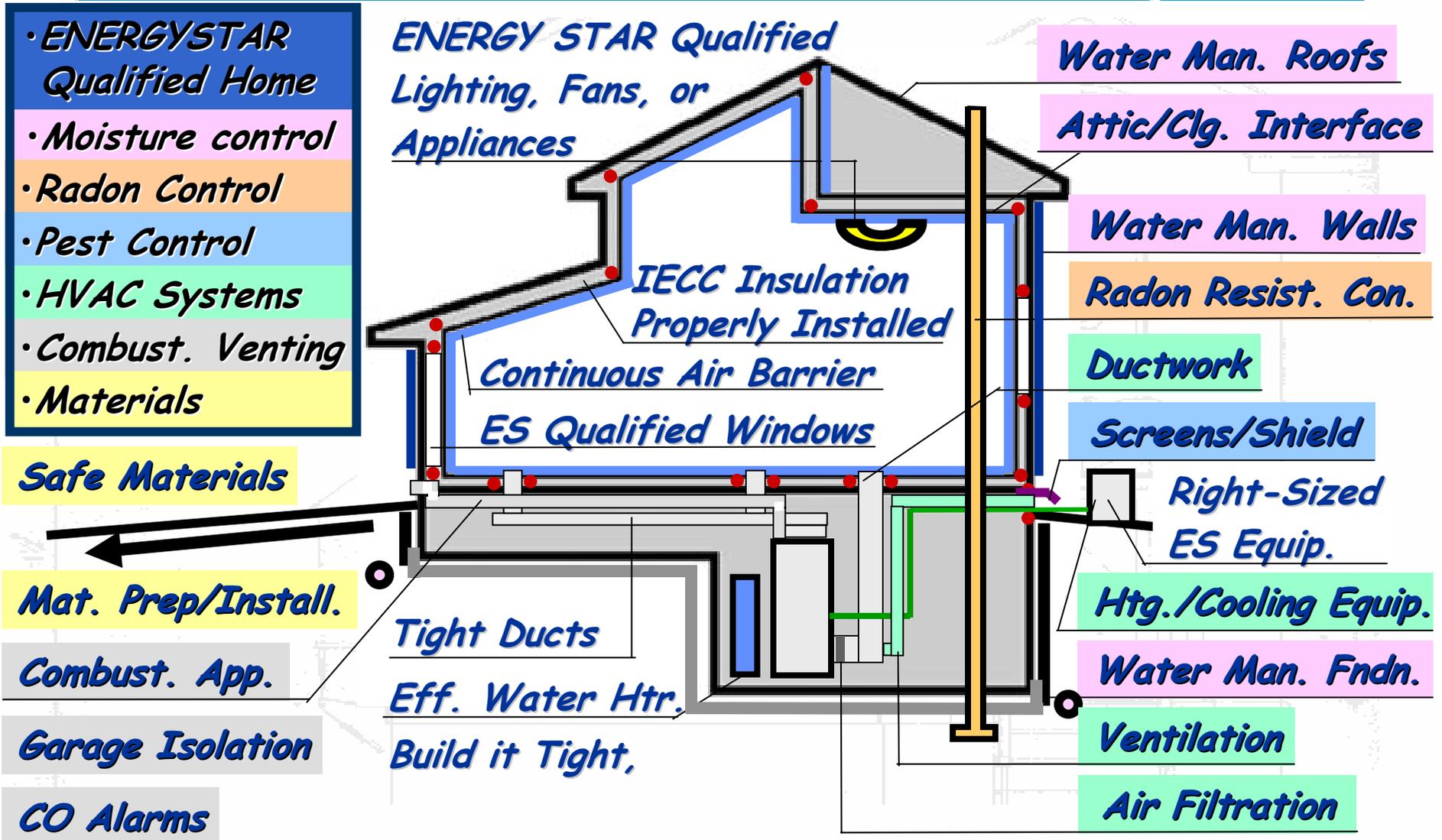
- *greater energy efficiency than standard*
- *performance advantage*

*...in other words,*

***protect the brand!***

WHERE IS IT GOING?

# ENERGY STAR INDOOR AIR PKG. SPEC



## HOW TO GET MORE INFORMATION



*On the Web at:*

*<http://www.energystar.gov/homes>*

