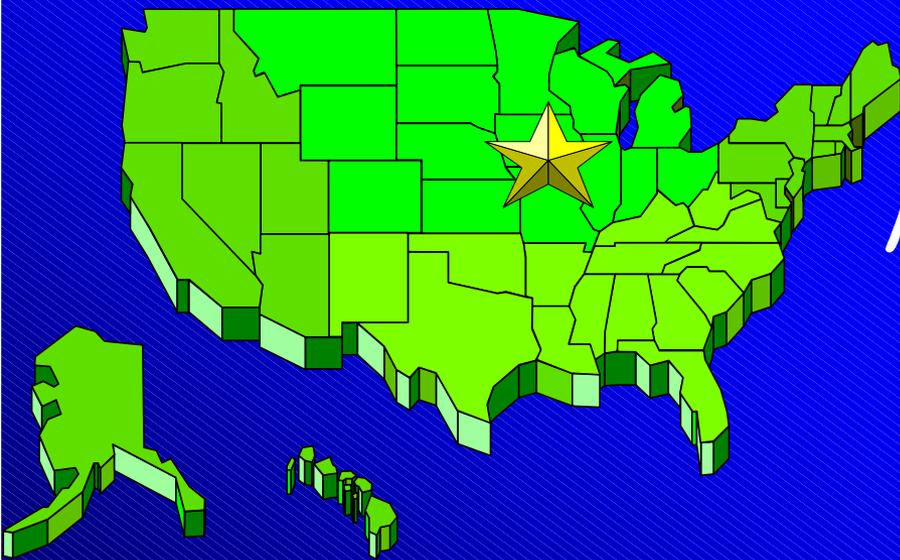


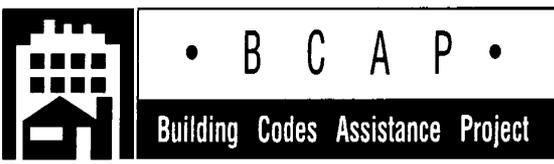
Energy Codes and the Insurance Industry: Opportunities to Profit from Partnership



*National Energy Code
Conference*

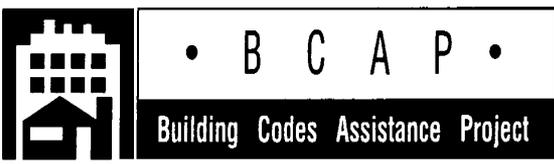
*July 16, 2002
Des Moines, IA*

Mike DeWein, BCAP Technical Director



BCAP

- Mission: promote adoption & implementation of up-to-date energy codes
- Non-profit group
- Founded in 1994 in response to EPA Act
- Sponsored by ASE, NRDC, ACEEE
- Funded by DOE & Energy Foundation

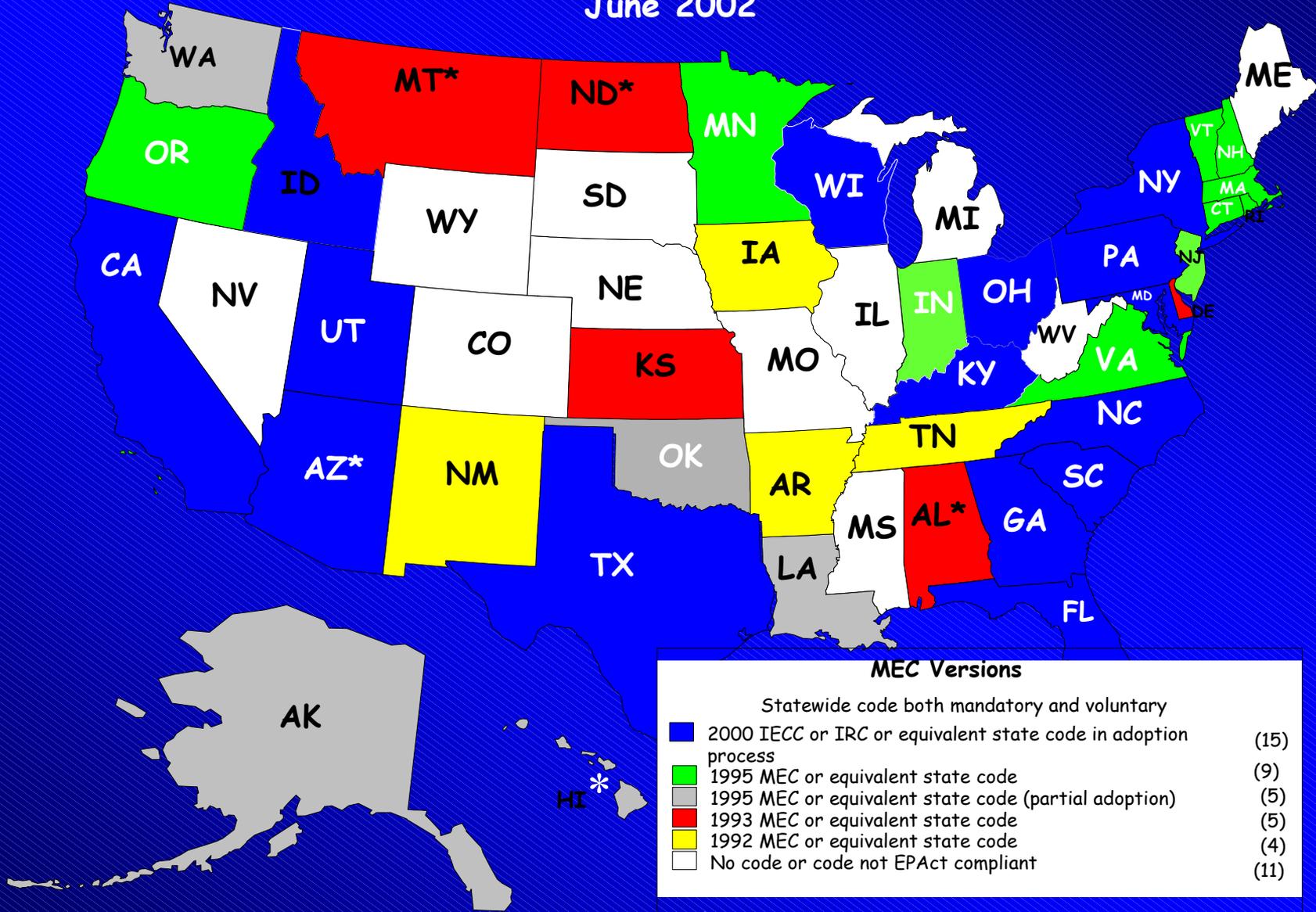


BCAP: What We Do

- **Advocacy**
 - ✓ Bring together local groups & recognized experts
 - ✓ Promote the energy-efficiency message
 - ✓ Promote the adoption of state/city energy codes and standards
- **Technical support**
 - ✓ Help states and other groups develop policy
 - ✓ Facilitate/help groups develop training plans and find resources
- **Education/outreach & research-**
 - ✓ Respond to wide range of code-related inquiries
 - ✓ Produce newsletters, issue briefs & position papers
 - ✓ Maintain extensive database and website
 - ✓ Promote the Energy Code message in many sectors

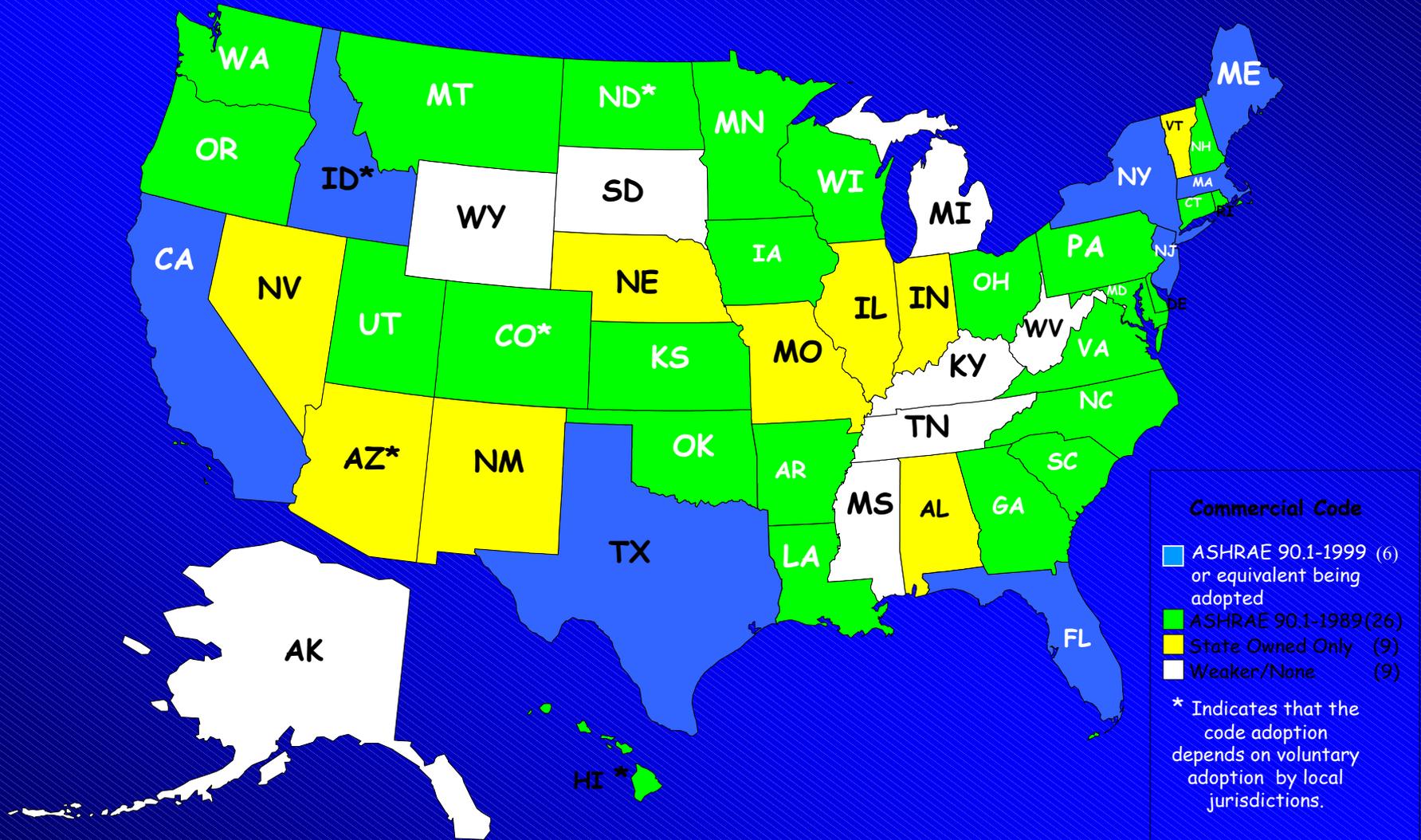
RESIDENTIAL ENERGY CODE STATUS

June 2002



COMMERCIAL ENERGY CODE STATUS

June 2002



Commercial Code

- ASHRAE 90.1-1999 (6) or equivalent being adopted
- ASHRAE 90.1-1989 (26)
- State Owned Only (9)
- Weaker/None (9)

* Indicates that the code adoption depends on voluntary adoption by local jurisdictions.



Challenge

*Codes are not being well
Implemented:*

- Training Inadequate*
- Compliance Low*
- Misunderstanding of Requirements and how to build them into buildings*
- We're NOT getting the projected energy savings OR building better buildings*



• B C A P •

Building Codes Assistance Project

The Building as a Beast!

The way we construct our buildings today may be working against us... As:

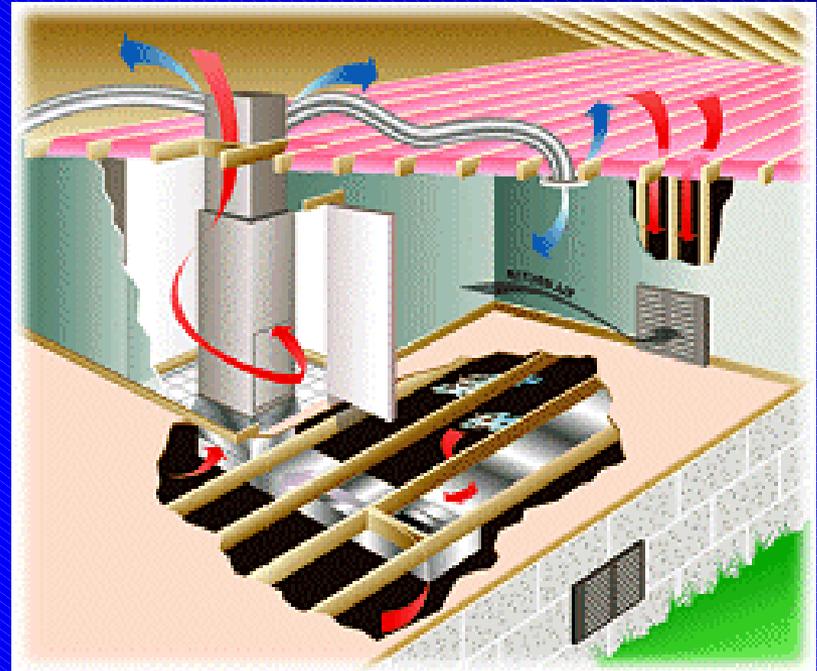
- Homeowners
- Building Owners/Operators
- Policy Makers
- States and Jurisdictions
- Code Enforcement Agencies
- **INSURANCE COMPANIES/UNDERWRITERS!**



The Building is a System

Including:

- Envelope
- HVAC
- HVAC Distribution
- Ventilation
- Other Systems
- OCCUPANTS!



How can we do a BETTER JOB with Codes?

Energy Codes:

How to make them work better?



Create
Partnerships to
better
implement them!



Let's start a coordinated process to improve the situation today!



Issues of Common Interest:

- Building Failures/Claims
- Builder Callbacks
- Liability
- Prevention Loss Prevention



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Building Codes Assistance Project

Problem: Moisture





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Why is Moisture Important?

- Moisture damage contributes to over 90% of all building and building material failures (ASHRAE)
- Except for structural errors, moisture is the leading cause of building problems costing more than 9 billion dollars annually in the US. (ASTM)
- Moisture-related problems lead the list of top callbacks for most Builders.
- Numerous consumer surveys list moisture problems as a primary concern



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Fact:

- The #1 callback for builders on a newly constructed home is due to moisture problems. Annual cost to builders is:
\$5.3 billion dollars.

— *National Association of Home Builders*



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Case Study From JLC

JLC-Update - Notebook Article - Mold & Moisture Bankrupt Big Builder - Microsoft Internet Explorer

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JLC UPDATE

Mold & Moisture Bankrupt Big Builder

How quickly after a new home is built can the walls develop serious mold problems? In the case of Cincinnati builder Zaring Homes, the answer was ten weeks. Zaring Homes was building over 1,500 homes a year during the mid-1990s, with annual profits of over \$6 million, and when dozens of its new homes became moldy in 1999, the company committed itself to fixing the problems. But the remedies soon became so expensive that the liabilities drove the company to bankruptcy.

Standing water. The first residents began moving into one of Zaring's new-home developments, Parkside, in Mason, Ohio, in May 1999. "In late July, the homeowners complained of wet carpet," says Gregg Nicholls, chief building official in Mason. "They saw mold on the subfloor. In August, holes were cut in the drywall to inspect the framing, and there was a quarter inch of standing water in the bottom of the stud cavities." Since Ohio was suffering a drought that summer, the amount of water was surprising. "We were able to wring water out of the fiberglass insulation," said Stephen Vamosi, a consulting architect at Intertech Design in Cincinnati.



Zaring Homes:

- Building over 1,500 homes a year during the mid-1990s
- Annual profits of over \$6 million
- Dozens of its new homes became moldy in 1999
- The remedies soon became so expensive it drove the company to bankruptcy.



Case Study (Continued)

JLC-Update - Notebook Article - Mold & Moisture Bankrupt Big Builder - Microsoft Internet Explorer
File Edit View Favorites Tools Help

are suing Zaring. "The brick is either installed flat against the sheathing, or the air space is filled with mortar."

But consultants hired by Zaring Homes and its insurance company concluded that the source of the water was exterior vapor, which entered the walls through permeable sheathing and condensed on the back of the polyethylene under the drywall. "Every one of the affected houses had air conditioning," says Vamosi.

Expensive repairs. Whatever the source of the moisture, the results were devastating for Zaring Homes. "Zaring did an incredible amount of remediation on a lot of homes," says Nicholls. "They stripped off the brick and the sheathing, so that the studs were open to the exterior. They pulled out all the insulation, put a mold-protective Kilz paint on the inside of the stud cavities, and rebuilt the walls." After the value of Zaring stock plummeted, all of the assets of the company were sold to Drees Company in January 2001, before remediation work was complete. "Zaring Homes went out of business because they have a \$20 to 50 million liability here," says Joe Lstiburek, one of the consultants involved. "Hundreds of homes are potentially involved. To fix the problems would probably cost \$60,000 to \$70,000 per home."

The Zaring story shows how small decisions can have enormous consequences for a builder. Early on in the moisture investigation, Vamosi gave some advice to Allen Zaring, the founder of Zaring Homes. "I told him, 'If you add another inch and a half of insulation to the walls, you will avoid the dew-point conditions,'" recalls Vamosi. "Zaring answered, 'I can't do that because it costs too much. No one else is doing that.' But look what happened to Zaring."

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- "I told him, 'If you add another inch and a half of insulation to the walls, you will avoid the dew-point conditions,'" recalls Vamosi.
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- "Hundreds of homes are potentially involved. To fix the problems would probably cost \$60,000 to \$70,000 per home."



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Problem - Mold/Rot!





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Solution - Energy Code Requirements for

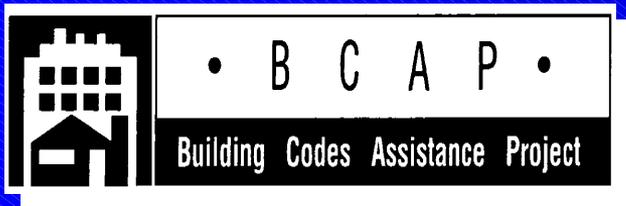
- Proper Air Sealing
- Insulation Continuity and quality of installation
- Duct sealing
- More later



Problem:

Extreme Weather Episodes

- 700 Heat Deaths in Chicago - 1995
- *46 deaths due to cold waves in the U.S. - 1995*
- Snowstorms of Great Lakes States
- Power Outages



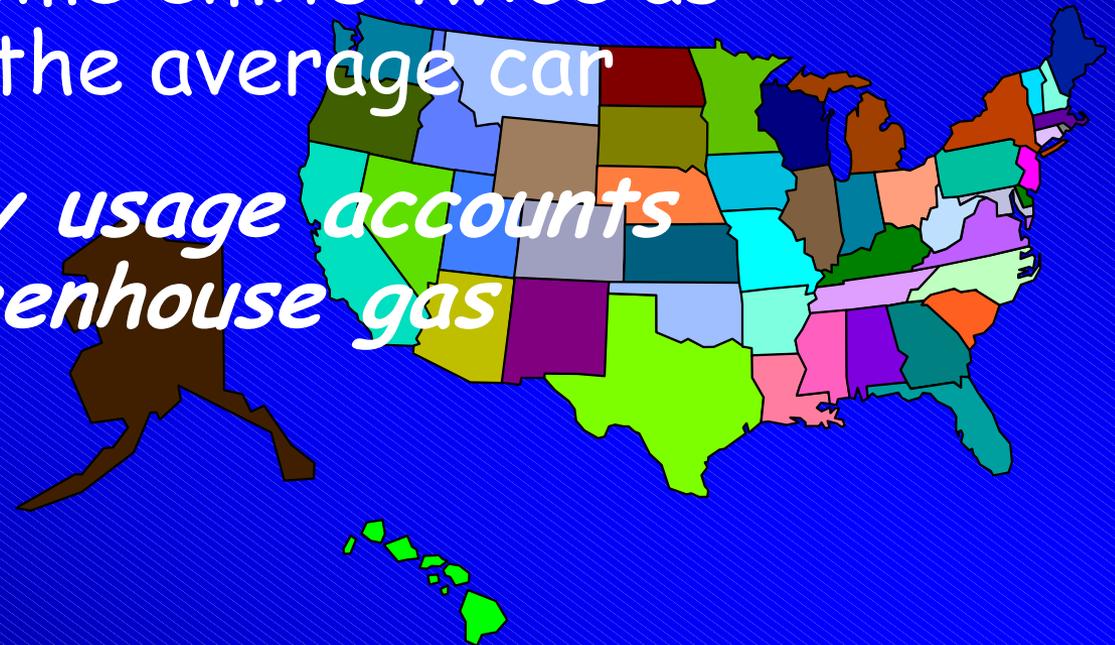
Solutions:

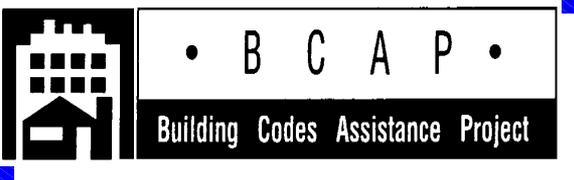
Energy Code Requirements

- Better Envelope Requirements
- Air Sealing
- Improved HVAC Efficiency and Sizing
- Incentives for Renewable Energy
- "Cool Roofs"

Problem: Global Warming

- In 1996, 1.5 million new homes built in US
- The average home emits twice as much ghg as the average car
- *Building energy usage accounts for 30% of greenhouse gas emissions.*





Solution: Energy Codes

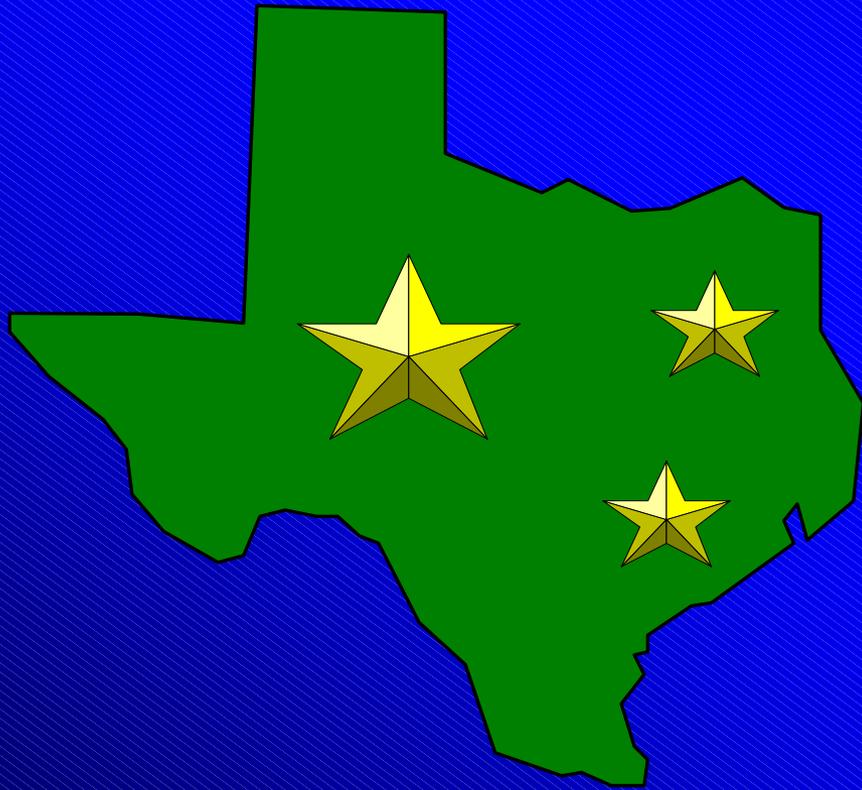
- Lowers the production of greenhouse gases
- Improves outdoor air quality from decreased combustion of fossil fuels
- Decreases need for new power plants
- Protects against next energy crisis
- Non-attainment Strategy (Texas)



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Example: Energy codes as Air Quality Non-attainment SIP - Texas!



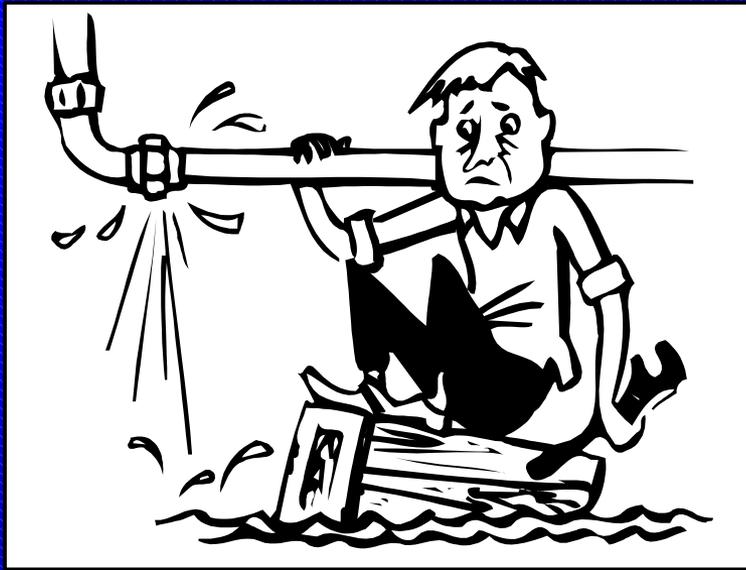
- EPA, Enviros, Builders, Energy and Housing Advocates coming together to develop regional, State Energy Codes in response to Non-Attainment issues
- Dallas/NTX COG, Houston, State standardization



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PROBLEM: Pipe Freeze/Burst!



Losses resulting from frozen water pipes were estimated to be \$450 million/year between 1985 and 1995.



Solution: Pipe Insulation

Table 503.3.3.1
MINIMUM PIPE INSULATION (in inches)

PIPING SYSTEM TYPES	FLUID TEMPERATURE RANGE, 'F	Pipe Sizes					
		Runouts up to 2"	1" and less	1.25" to 2"	2.5" to 4"	5 to 6"	8" +
HEATING SYSTEMS							
Low Pressure/Temperature	201-250	1.0	1.5	1.5	2.0	2.0	2.0
Low Temperature	120-200	0.5	1.0	1.0	1.5	1.5	1.5
Steam Condensate	Any	1.0	1.0	1.5	2.0	2.0	2.0
COOLING SYSTEMS							
Chilled Water, Refrigerant and Brine	40-55	0.5	0.5	0.75	1.0	1.0	1.0
Chilled Water, Refrigerant and Brine	Below 40	1.0	1.0	1.5	1.5	1.5	1.5

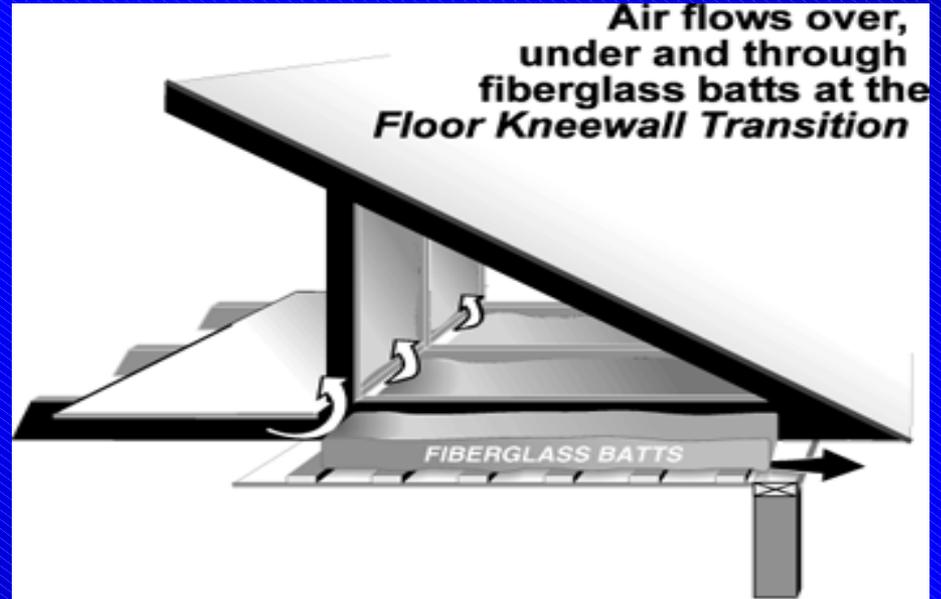
Hydronic Piping Insulation



Problem - ICE DAMS!



In 1995, the damage incurred from one storm resulted in \$20 to \$30 million in losses.





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Solution - Energy Code Requirements:

- Insulation Levels
- Air Sealing
- Duct Sealing



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What's Missing?

Training on details of:

Infiltration Control, Duct Sealing!



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Myth: Insulation Stops Air Leaks



Some insulation is no more effective at stopping air and cold drafts, than an umbrella is at stopping the wind

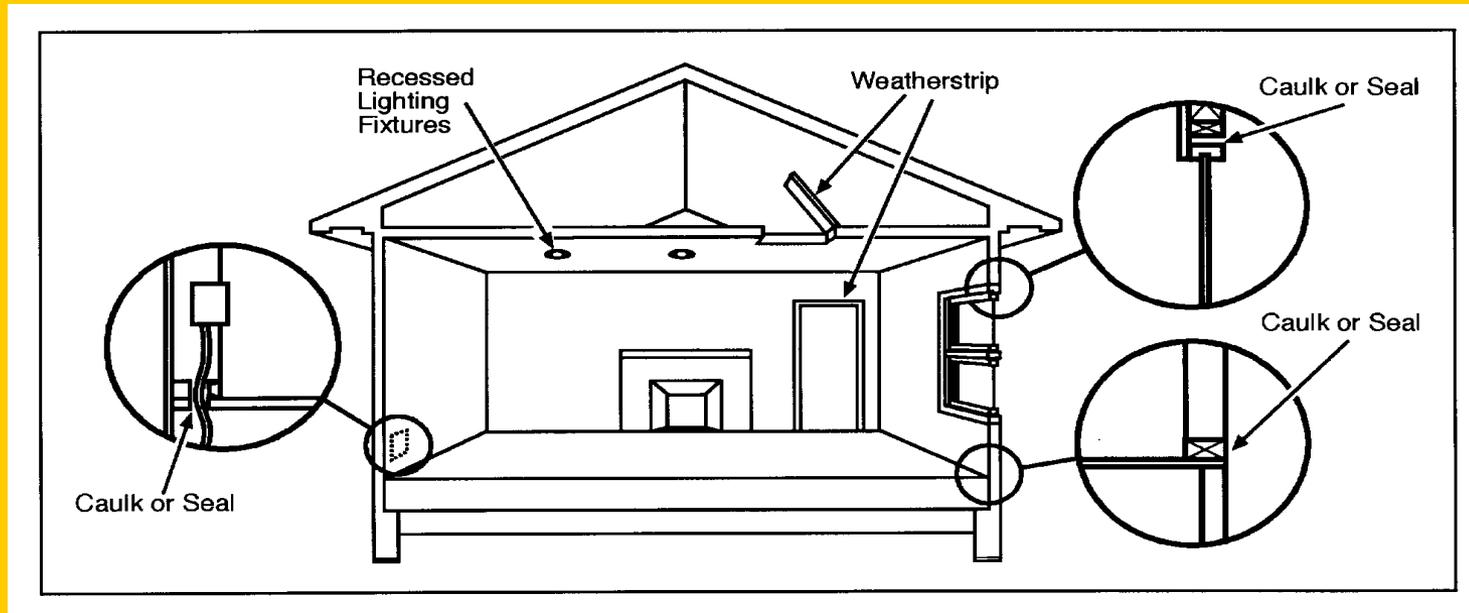
Insulation Installation
KEY!



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Infiltration Control



Infiltration Control:

Seal all joints, penetrations and other such openings in the building envelope



Fire blocking

- Required in Floor, Wall and Roof Assemblies.
- Must Cut off All Concealed Draft Openings:
 - ✓ Between Stories.
 - ✓ Between the Top Story and Roof Space.
- At Intersections Between Vertical and Horizontal Spaces:
 - ✓ Soffits
 - ✓ Drop Ceiling
- Opening Around Vents, Pipes, and Ducts at Ceiling and Floor Level

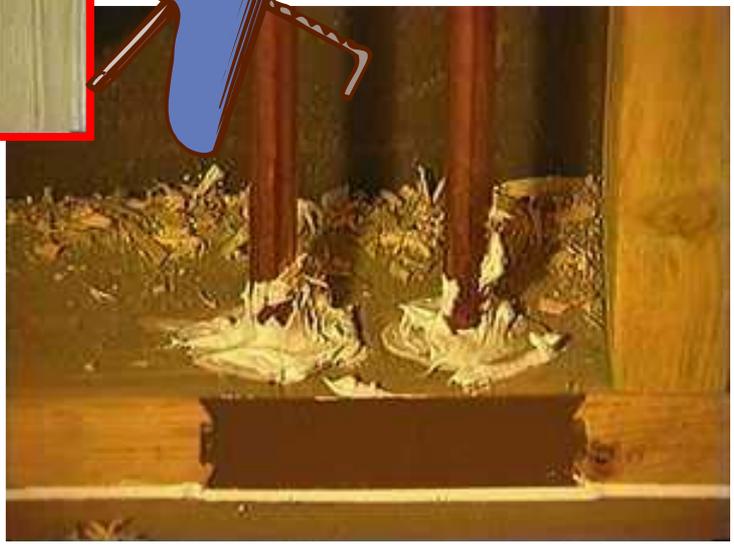
Manual: 7-13
IRC-R602.8





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Infiltration Control





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Small Holes Too!



Seal Utility
Penetrations!



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Windows, Windows, Windows!

Seal Around Windows!





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Air Tight Recessed Fixture





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Too Much Moisture Leads To:

- Building Durability Issues
- Mold and Mildew
- Discomfort
- Condensation on Windows
- Increases Potential for Poor Indoor Air Quality



Why is Indoor Air Quality Important?

- In 1994, EPA ranks health risks of 26 leading environmental hazards. The top concern was indoor pollution.
- Indoor air quality has been demonstrated to be many times worse than outdoor air quality
- We spend 90% of our day indoors and 65% of that is in our homes
- Asthma rates have increased dramatically in the last 12 years. Adults up 61%. Children up 72%.



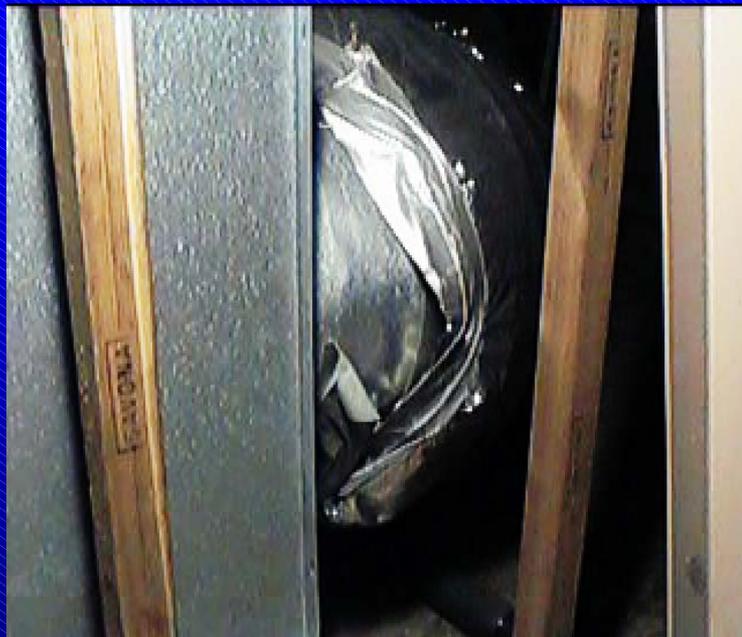
Duct Leaks

- **Contribute to Air Leakage in House**
 - ✓ Adds 30-300 % to ACH While the Blower is on
- **Reduce Comfort in Home**
 - ✓ Increase Drafts
 - ✓ Reduce Air Delivery / Unbalanced Airflows
- **Contribute to Moisture Problems!**
- **Contribute to Backdrafting**
 - ✓ Leaky Return Depressurizes Lower Floors
 - ✓ Especially When Competing With a Smoldering Fireplace (600 Cfm)

Duct Systems Air Sealing



Duct Requirements (or lack thereof)





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Energy Codes - Why the Insurance Industry needs to be more involved:



- There's Money in it!
- Better Adopted and Implemented Energy Codes can lower Liabilities!

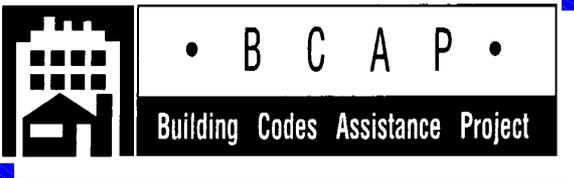


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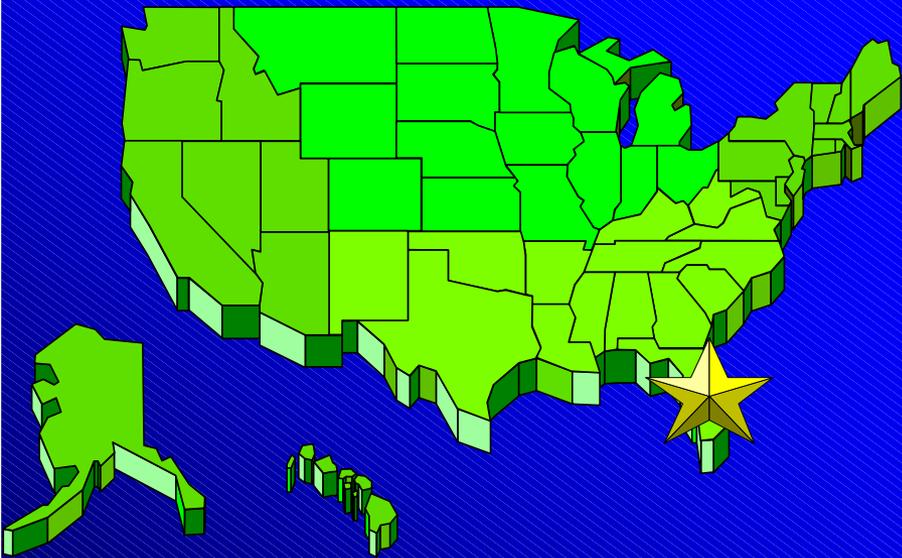
Energy Codes - Why the Insurance Industry needs to be more involved:



- There's More Money in it!
- Opportunities to market through Implementation assistance
- Opportunities to create new products based on improved performance of buildings



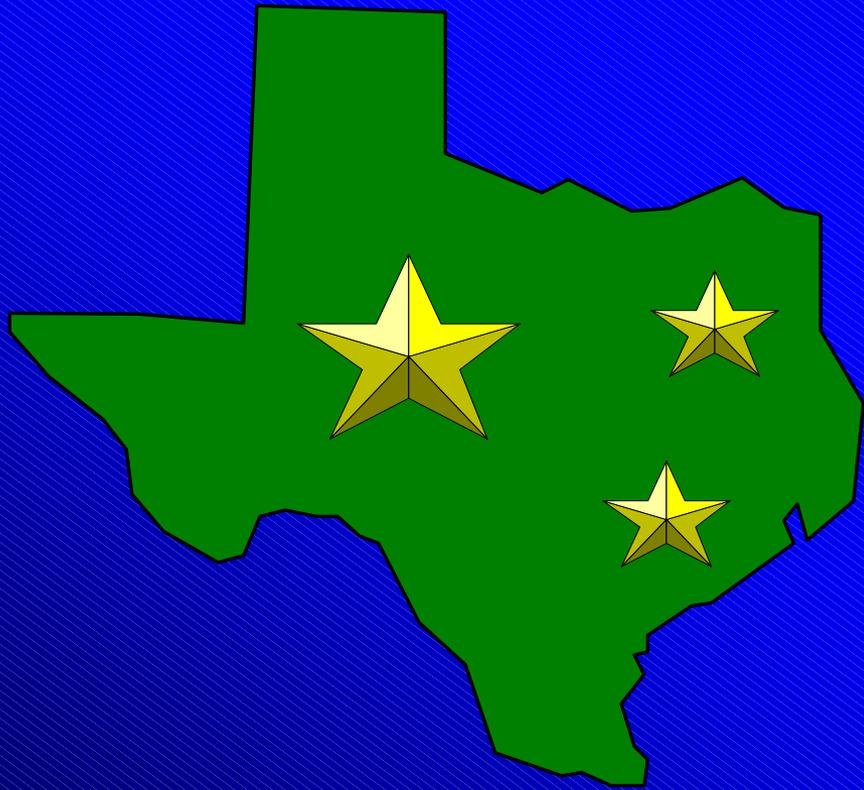
Early Successes: Cooperative work with IBHS Code Cmte.!



- BCAP, IBHS Code Cmte meeting in January '02
- Coordinating and supporting cooperative code work
- Leading to relationships with Insurance companies, ISO, AAI, etc.



Early Successes: Code/Beyond Code Training in Texas!



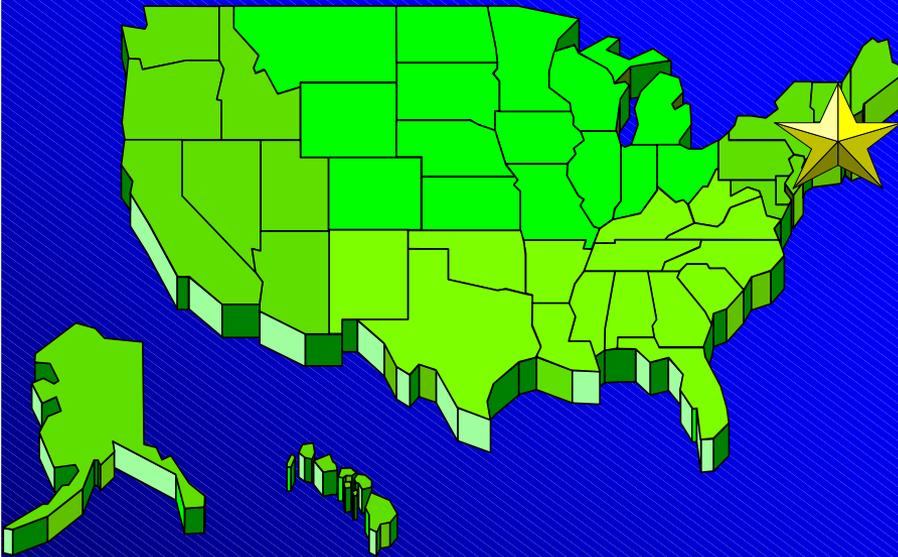
- BCAP, TAB, TX A&M, BPCI, collaborating on proposal for combined training in TX
- Camroden, BSC to develop Mold training, guidelines
- Videos for Builders, Subs
- Leverage DOE SEP \$ with TX SECO?



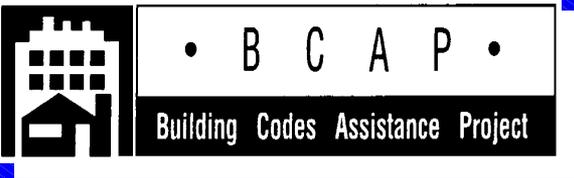
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Early Successes: ISO Considering Energy Code scoring in BCEGS!



- BCAP, ISO, IBHS collaborating effort to incorporate Energy into grading scale
- Need evidence that this will be doable by states, code offices
- ICC Energy certification may be key

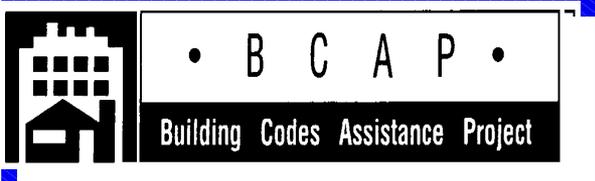


Energy Codes - Why The Insurance Industry needs to be more involved:



They are part of the Industry's
job, and make it easier

Energy Code requirements can have major
positive impact on many building-related
failures and related liabilities!



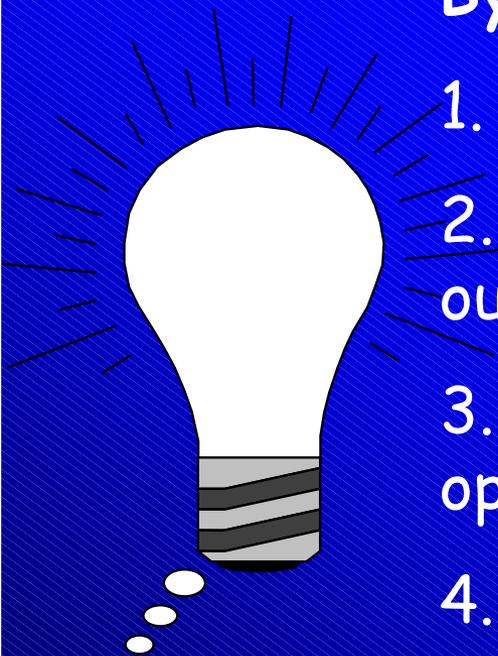
Energy Codes:

How can the Insurance Industry assist and benefit?

By getting more involved!

1. Assist BCAP and partners in state Adoption
2. Assist states in Implementation, training, and outreach, i.e NE Regional Code Support Project
3. Collect Claim Data differently to assess opportunities for intervention and strategies
4. Add grading component of BCEGS for Energy codes
5. NY/IL/ICECF Pilot Project?

Let's start the dialogue Today!





Energy Codes:

How does the Energy Code world benefit?



Help with implementation!

Help with training, outreach

Help in improving builder/contractor buy-in!

Offer new and potentially more effective implementation mechanisms!!!

Create products that incentivize Energy Codes and better building performance??

Energy Codes: Who better than the Insurance Industry to help deliver the message?

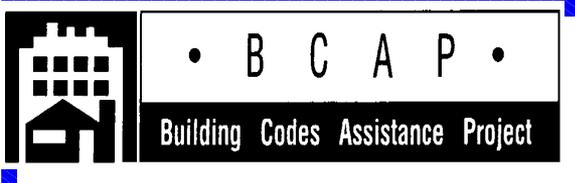


Most Important: The chance to
impact ALL buildings!

Reduce homeowner claims

Reduce Builder/Owner/Developer
Claims!

Some currently involved already through
enhanced Marketing activities!



Why Bother?

Because buildings the
construction infrastructure
AND YOUR INDUSTRY
work as a system



Can't ignore the codes infrastructure as
part of the system

Tremendous opportunity to change it for
the better

Opportunity for all to impact all
buildings!!

**MOST OF ALL - Increased
opportunities to REDUCE LIABILITY!!!**



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ALLIANCE TO
SAVE ENERGY

No.
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April
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MAD

OUR PRICE
35c
CHEAP



ILLUSTRATION BY WING

WHO NEEDS YOU



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ALLIANCE TO
SAVE ENERGY

Mike DeWein
Tech Dir. BCAP

Ph 518.664.1308

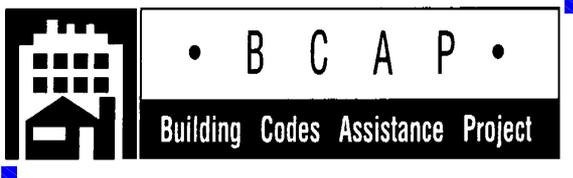
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