

# Energy Codes: Enforcement with Education



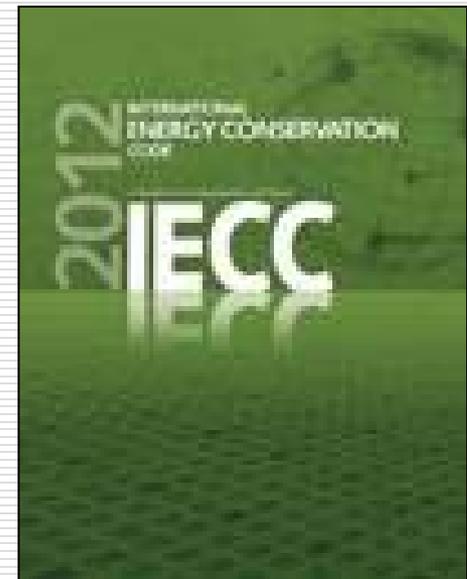
“The educated do not share a common body of information, but a common state of mind.” Mason Cooley



# Energy Codes: Enforcement with Education

## Why Energy Code Education?

- Education and training about the energy code is very important because of the changing nature of energy codes, in that they are constantly under revision
- Energy codes can't exist as just a set of rules, they must become a mindset.
- Finally, energy codes must be translated in to energy awareness and need to be ingrained in all of the stakeholders of the building process



# Energy Codes: Enforcement with Education

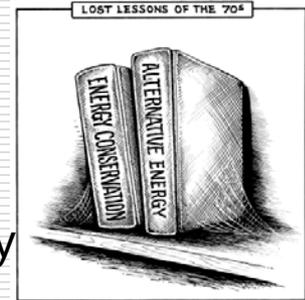
## What to expect in this presentation:

### First part of presentation:

- I'll be talking about educating code officials, building professionals and trades people...in other words, the people that must use the energy codes as part of their daily job
- Then, I will touch on the third rail of energy codes, the people that own and operate buildings and whom must feed these energy consuming beasts energy for a lifetime

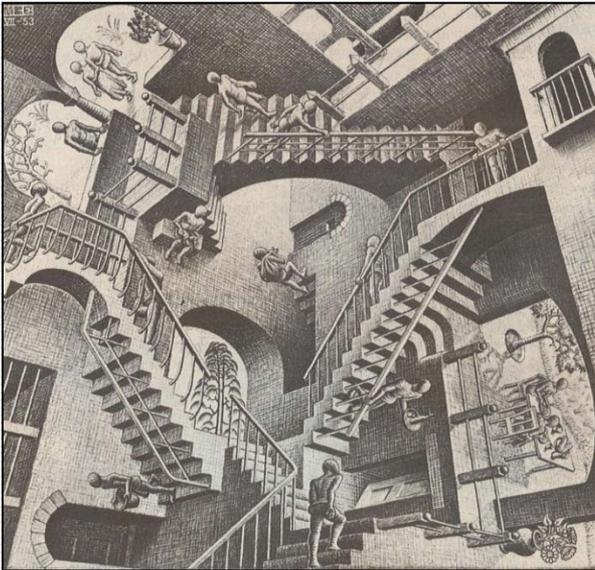
### Second half of presentation:

- Dr. Shirley Niemeyer will discuss how to educate the public and homeowners on additional ways to be energy efficient
- John Hay will discuss how to teach people about alternate energy



# Energy Codes: Enforcement with Education

## Lessons learned in Energy Code Education



Perception of  
Energy Codes

- The single largest barrier to energy code compliance is a copy of the code.
- The second largest barrier to energy code compliance is the availability of quality and diverse education, targeting all aspects of the building industry.
- We do need to educate and train the building officials, designers and builders in the details of the energy codes.
- This is a particularly difficult job when the energy codes change every three years...and not just little changes

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- A study by Mathis Consulting, a specialist in building codes, standards development and compliance, suggests that in energy code education, there is:
  - A need for multiple learning structures
  - The need to engage a wider audience in the training
  - The expansion of consumer education, from home builders to home buyers
  - Development of a portfolio of tools for building officials and other to help ensure code compliance
  - Finally, an expansion of consumer education regarding the importance of the energy code and compliance

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“The trouble with energy efficiency is that it is boring,  
Powerful, but boring.” R. Christopher Mathis



# Energy Codes: Enforcement with Education



- Different people learn in different ways
  - Some are visual
  - Some are tactile
  - Some learn by reading
  - Others by experiencing
- For energy code training to be most effective, each type of teaching technique must be employed

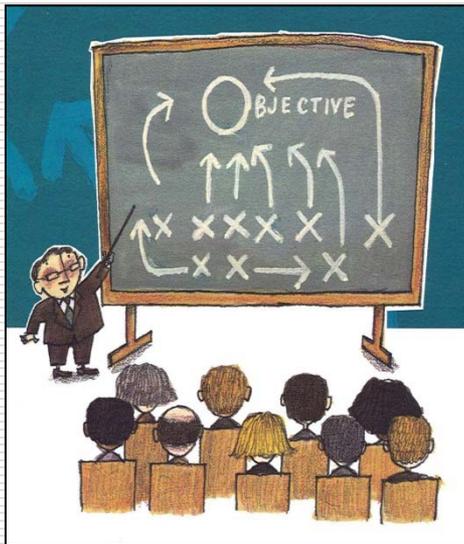


What I hear, I forget. What I see, I remember. What I do, I understand.  
-Confucius

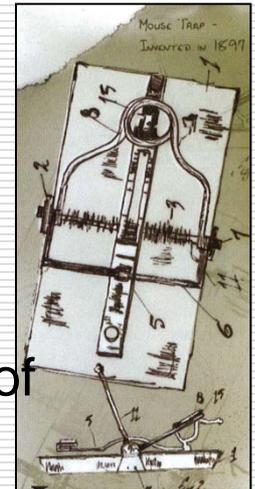


# Energy Codes: Enforcement with Education

## Education and Training is a Process



- There are many approaches and philosophies to teaching and learning
- There are a lot of good teaching methods, classes and sessions for educating the people that are already trained, or at least should have some knowledge of energy codes
- So in this session, we are not going to invent a new mousetrap, but instead show you some tried and true methods of teaching energy codes



# Energy Codes: Enforcement with Education

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David Cohan, a staff member of the NEEA-Northwest Energy Efficiency Alliance has done research and written a paper entitled:

## "A comprehensive approach to Energy Code Education and Training"

This is a very complete guide which describes a multi-tiered approach to Energy Code Education and Training, because in a survey conducted by the NEEA, the largest barrier to code compliance is the lack of knowledge.

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# Energy Codes: Enforcement with Education

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**Before we look into the teaching approach proposed by NEEA, let's look at the traditional approach to code education and training:**

- Traditionally, teaching of energy codes is generally offered in a small number of locations across a state
- Usually during the first year of new code implementation
- Characteristics of these presentations:
  - Usually these are slide or PowerPoint presentations
  - Each presentation covers the entirety of the new code
  - Or only the updates or changes from the previous code

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## What's the problem with the way we've been teaching energy codes?

- Typically energy code education and training offers only a high-level overview of code changes and nothing more
- Provides very little practical information on how to apply or comply with new requirements
- Reaches only a fraction of the target audience

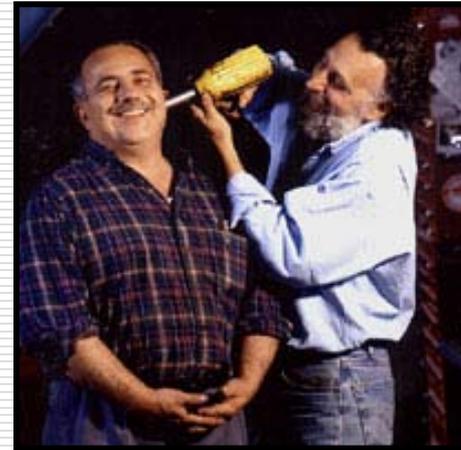


So....what's the problem!

# Energy Codes: Enforcement with Education

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Onto a better  
and  
more effective way to  
learn  
Energy Codes



Drilling this information into our heads

# Energy Codes: Enforcement with Education

## A comprehensive approach to Energy Code Education and Training

- NEEA research described a multi-tiered approach to energy code education and training starting from a broad general overview to very specific issues
- General Overview or classroom based sessions are followed by focused training that address in-depth areas of the code
- This comprehensive approach is then enhanced by visits to both building departments and industry firms in which a trainer sits with department or firm staff
- Finally telephone or on-line technical assistance



# Energy Codes: Enforcement with Education

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## First Tier of learning: General Overview

- When people speak of education and training for energy codes they are almost invariably referring to classroom-based sessions and it is the first step of this approach
- This is usually a broad spectrum look and sets the stage for energy codes and energy efficiency in buildings
- Usually these are PowerPoint presentations which describe a section of the code highlighting changes from the previous version of the code...or the presentation covers the entirety of the new code
- This is frequently an “Introduction to Energy Codes “ or a quick overview of what’s changed since the last version



# Energy Codes: Enforcement with Education

- The main limitation to a general overview or classroom style of training is the amount of time required to convey the information
- Very few people will sit through 4-6 hours of training unless it is required by their job
- Most importantly, it is difficult for most people to retain the majority of the information delivered in a single 4-6 hour presentation



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- Generally, classroom based training will be held at a location with a venue that can facilitate a large group and usually requires travel, sometimes out of town
- While learning, there is a loss of productivity from normal work
- Flow of information at these sessions is usually only one-way; from the instructor to the attendees

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## General Overview in the 21<sup>st</sup> Century

- Traditionally, most General Overview education has been done live, however on-line or web based presentations are starting to gain popularity
- These electronic formats can be broken down into shorter pieces
- Many states, organizations and the Department of Energy office offer on-line webinars for learning energy codes.
- Locally, the Nebraska Energy Office has links to webcasts and other energy code information
- Energy code training “on demand” has the potential to increase participation and retention
- *Biggest advantages is that people can learn in their spare time, at their own pace and a little bit at a time*



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## Targeted Training

- The General Overview method of teaching gives a good foundation, now onto Targeted Training
- Next we need to engage people in the practice of integrating energy codes into their work
- Not all areas of the energy codes are equal in the likelihood the people understand or comply
- Elaborating or teaching one single aspect of the code is a good example of “Targeted Training”



# Energy Codes: Enforcement with Education



- Targeted training should allow time to present context, theory and applications
- Depending on the complexity of the topic, these sessions can last anywhere from one hour (appropriate for a brown bag lunch session) to an entire day or longer
- Many community colleges offer training courses to the mechanical, plumbing and electrical trades to make workers aware of new techniques and bring them up to speed on building and energy codes.

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There are many sources for targeted training as close as the tips of your fingers

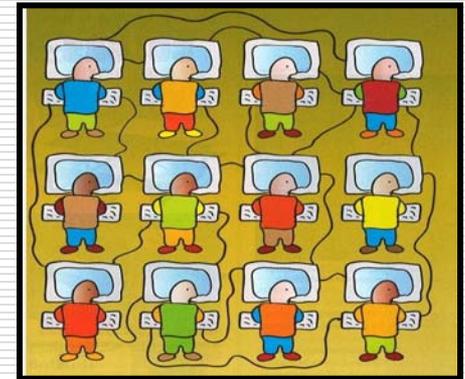
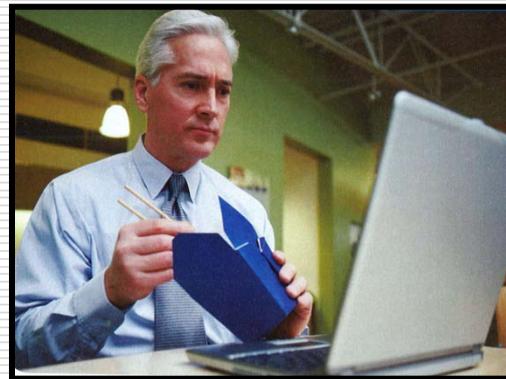


- Many states offer energy code training, the Nebraska Energy Office has webcasts and links to webcasts on various aspects of the energy code
- Energy code training “on demand” has the potential to increase participation and retention
- The amount of on-line information available is growing every day

# Energy Codes: Enforcement with Education

## Advantages of on-line training

- *Biggest advantages of on-line targeted training is that people can learn in their spare time and at their own pace*
- *Cost of creating is very low and cost to watch is usually free*
- *And they can be accessed from any where in the world*



# Energy Codes: Enforcement thru Education

**Outreach = providing an activity or information to people who might not normally have access to those services**

- Targeted training is a very good way to instruct and get specific information in the hands of building owners and homeowners
- Several University's around the country have Extension programs that have faculty who's specific job is getting this information out to the public



# Energy Codes: Enforcement with Education

## Third tier of training: Site Visits

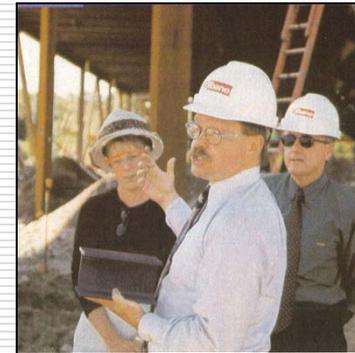
- The predetermined content of the Overview and Targeted training sessions severely limits the time that can be spent addressing specific applications or problems which individuals confront when attempting to apply the code
- Site visits are designed to overcome this limitation by sending trainers directly to local building departments and design and construction firms



# Energy Codes: Enforcement with Education

## Site Visits

- Site visits are generally more conversational in nature, with an emphasis on the needs and concerns of the participants rather than a predetermined topic
- At building departments, trainers (sometimes thought of as mentors) work with staff on plan reviews, both asking and answering questions



# Energy Codes: Enforcement with Education

## Site Visits



- Trainers may accompany building officials or designers to building sites observing typical inspections and making recommendations and improvements
- When visiting design and construction firms, trainers can review individual blueprints or specs as well as provide clarity on confusing sections of code

# Energy Codes: Enforcement with Education

## Site Visits

- Optimally, site visits are part of a circuit rider strategy where an individual or trainer visits the same site on an on-going basis and is available by phone or e-mail in the interim.
- Appropriate intervals for the visits may vary from 2-3 times per year to as frequently as weekly or monthly
- The intent is to have the trainer/circuit rider(s) establish a long term relationship in which they come to be regarded as reliable and credible information sources concerning energy codes
- Above all, it is critical the trainers mission is solely educational; participants must understand they are not being judged or reported



# Energy Codes: Enforcement with Education

## Site Visits: in conclusion



Hands on training with an expert instructor is the most effective, time-saving way to learn



“We learn by example and by direct experience because there are real limits to the adequacy of verbal instruction” Malcom Gladwell



# Energy Codes: Enforcement with Education

## Final tier of training: Technical Assistance

- The easiest way to learn is by getting immediate answers to questions as illustrated by Site Visits
- People obligated to enforce and comply with the energy code need answers to questions whenever they arise
- In many cases acquiring answers to code questions is time sensitive and delays may have direct financial impact on a project and almost always have an impact on the schedule
- As our final tier of training, a good education or training program should include telephone and e-mail hotlines with dependable and quick turnarounds.



# Energy Codes: Enforcement with Education

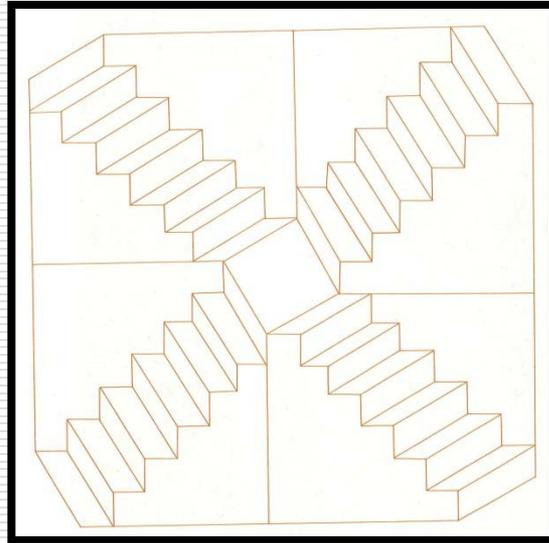
## Technical Assistance

- This is probably the one educational and training concept that is the hardest to achieve
- Establishing universal awareness of these resources and how to access them requires a serious, consistent communications effort.
- And finally, a necessary adjunct to these services is a website which is well advertised and contains official energy code documents, supporting tools/materials and contact information for technical support



# Energy Codes: Enforcement with Education

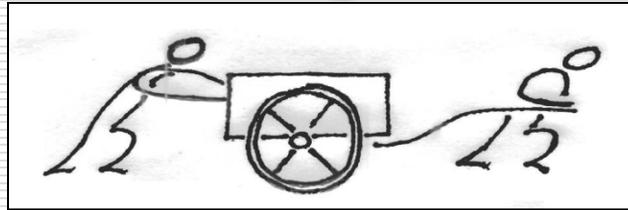
"A comprehensive approach to Energy Code Education and Training"



Putting it all together

# Energy Codes: Enforcement with Education

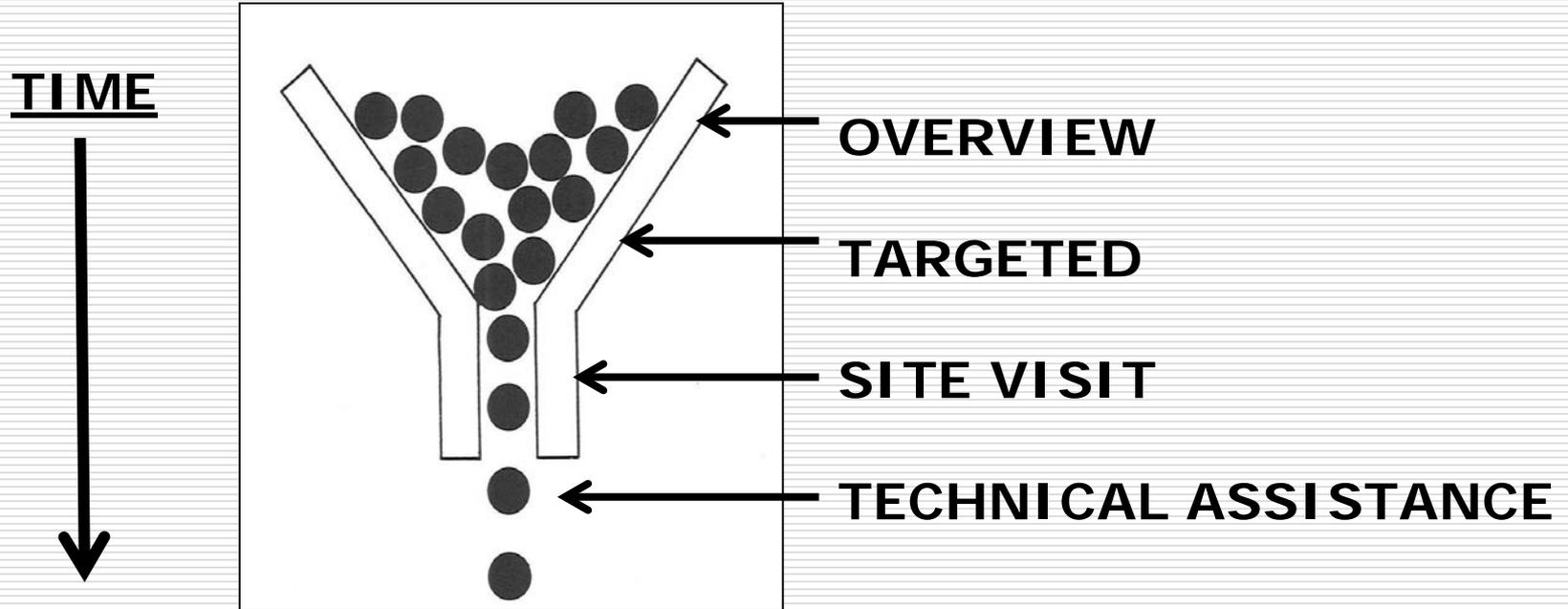
## Making this model of education and training work:



- This Comprehensive Training model is a process and there is a relationship between the four steps
- The General Overview, Targeted Training, Site Visit and Technical Assistance elements can be thought of as a funnel
- They start with broad and technical information at the widest point
- Then provides increasingly specific, practical information as it narrows

# Energy Codes: Enforcement with Education

## Graphic relationship of the four types of Education and Training Activities



# Energy Codes: Enforcement with Education

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## A comprehensive approach to Energy Code Education and Training

A comprehensive approach to teaching energy codes is necessary because most people need to hear information multiple times in multiple forms before they can confidently apply it on their own.



# Energy Codes: Enforcement with Education

## Some lessons learned in Energy Code Education from the State of South Carolina

- First of all, this report recommended significant expansion of energy code training across the state; after all “the single largest barrier to energy code compliance is a copy of the code”
- Next, it recommended multiple learning structures from classroom to field training
- Lastly, it suggested that engaging a wider audience in training from home builders to home buyers



# Energy Codes: Enforcement with Education

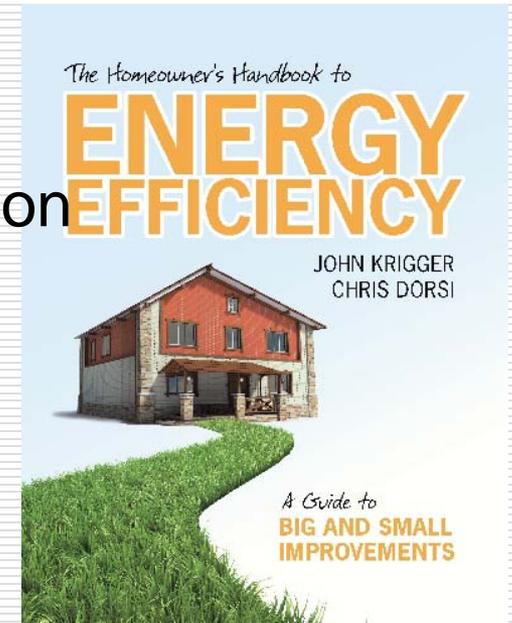
## Consumer Outreach and Education

- The focus so far has been on efforts aimed at audiences who interact directly with energy codes
- The message of energy codes and building energy efficient buildings must go beyond the building community
- There is a need to promote the education and outreach of energy efficiency to building owners and home owners

# Energy Codes: Enforcement with Education

## Reach out to the sector most impacted by energy codes:

- Homeowners and the general public play an important role in shaping residential and commercial construction activity
- A public that values and demands energy code compliant buildings compels builders and contractors to become more aware of code requirements



# Energy Codes: Enforcement with Education

## Outreach

- Energy codes save building owners and home owners money; this may compel them to learn techniques for exceeding the energy codes.
- An informed and vocal general public can have a strong influence on policy makers ensuring energy code issues continue to receive the attention and resources necessary to achieve widespread compliance



# Energy Codes: Enforcement with Education

## Outreach

- The goal of any energy awareness program should be to increase consumers awareness on the importance of energy efficiency and educate them on the multiple benefits of energy code and the building practices that support these codes
- Customers who know more will do more about energy efficiency so we should emphasize and expand upon market-transforming public education campaigns



# Energy Codes: Enforcement with Education

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## What is the best way to get people involved and interested in saving energy?

- Teaching the public how to analyze their building operations costs will, over time, help them to understand their home energy performance
- Labeling and outreach campaigns such as LEED, Energy Star for Homes and Built-Green help to showcase above-code performance

# Energy Codes: Enforcement with Education

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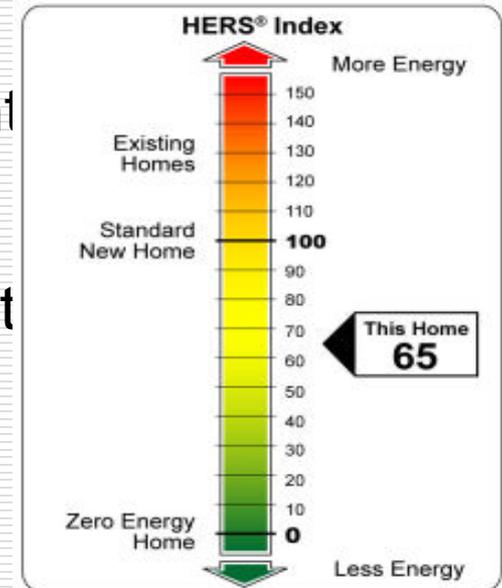
## What is the best way to get people involved and interested in saving energy?

- One way of getting consumers interested in noticing how much energy their buildings or homes use is by assigning a rating to the building
- The Energy Star Rating System is a good example of outreach to consumers and putting energy savings in terms everyone can understand

# Energy Codes: Enforcement with Education

## *Home Energy Rating (HERS)*

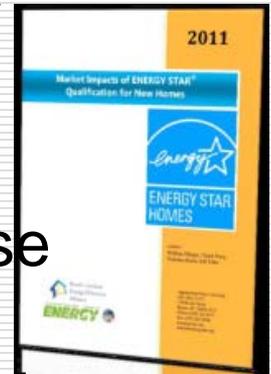
- Presented as a 0-100 point index
- 100 = a home that uses the same amount of energy (100%) of a code-built home
- 80 = a home that uses only 80% of the energy that a code-built home uses (must  $\leq 80$  to be an ENERGY STAR Home)
- An important note is that these ratings are performed by an independent 3<sup>rd</sup>-party



# Energy Codes: Enforcement with Education

## Energy Performance Scale

- Used to measure and track a building's energy performance
- Building owners can accurately determine “How efficient is my building” compared to other nationwide
- This scale puts a building's measured energy use in perspective, allowing owners, managers, prospective purchasers and home owners to make more informed decisions about how to manage and use buildings



# Energy Codes: Enforcement with Education

## Energy Star is educating the public:

- Energy Star is actively trying to get homeowners involved in energy efficiency and has a very active ad campaign
- The HERS scale is easy to understand and easy to compare – equivalent to comparing MPG on a car
- They put energy performance of buildings into layman's terms



# Energy Codes: Enforcement with Education

## Code Compliance with Education

### In conclusion:

- First we must educate the building inspectors, designers, contractors and trades people in the importance of energy efficiency and energy codes
- Education takes on many forms including printed brochures, online courses or webinars, classroom training and in-the-field training
- Having local code officials conduct the training allows them to be seen as an educator rather than just a policing authority



# Energy Codes: Enforcement with Education

But...all of the above misses the most important stakeholder-  
Building owners & Home owners

## How do we do this?

- While building owners and home owners may not even know about the State Energy Office, many are familiar with the University's Extension Programs
- Most state University's in the U.S. are geared toward Extension or Outreach
- Extension is a familiar face and an easy and convenient way to bring this information into everyone's home



# Energy Codes: Enforcement with Education

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## UNL Extension

- The Extension arm of the University of Nebraska's Institute of Agriculture and Natural Resources offers educational programs to residents in all 93 counties through out the state
- This makes UNL Extension (through webinars, on-line eExtension web sites as well as links to the Nebraska Energy Office) a good conduit for a public education campaign to raise awareness of energy codes and ultimately provide more efficient homes

