ACCELERATING ENERGY EFFICIENCY IN THE NEW CONSTRUCTION MARKET WITH STRETCH CODES

ACEEE Summer Study

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Overview

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- Jurisdiction Size – Municipal vs. State
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Definition of Stretch Codes

- "Stretch" or "reach" codes allow individual municipalities or jurisdictions to adopt more stringent energy codes within a larger, usually statewide, jurisdiction.
- Municipalities adopt and then implement what is usually the next generation of the energy code one code cycle early
- Examples:
  - ENERGY STAR Homes
  - HERS energy rating at a level 10-15% more stringent than base code
  - New Buildings Institute "Core Energy Code" standards
  - Green building elements along with code energy provisions
- DOE reports 300+ instances of stretch codes in 2009

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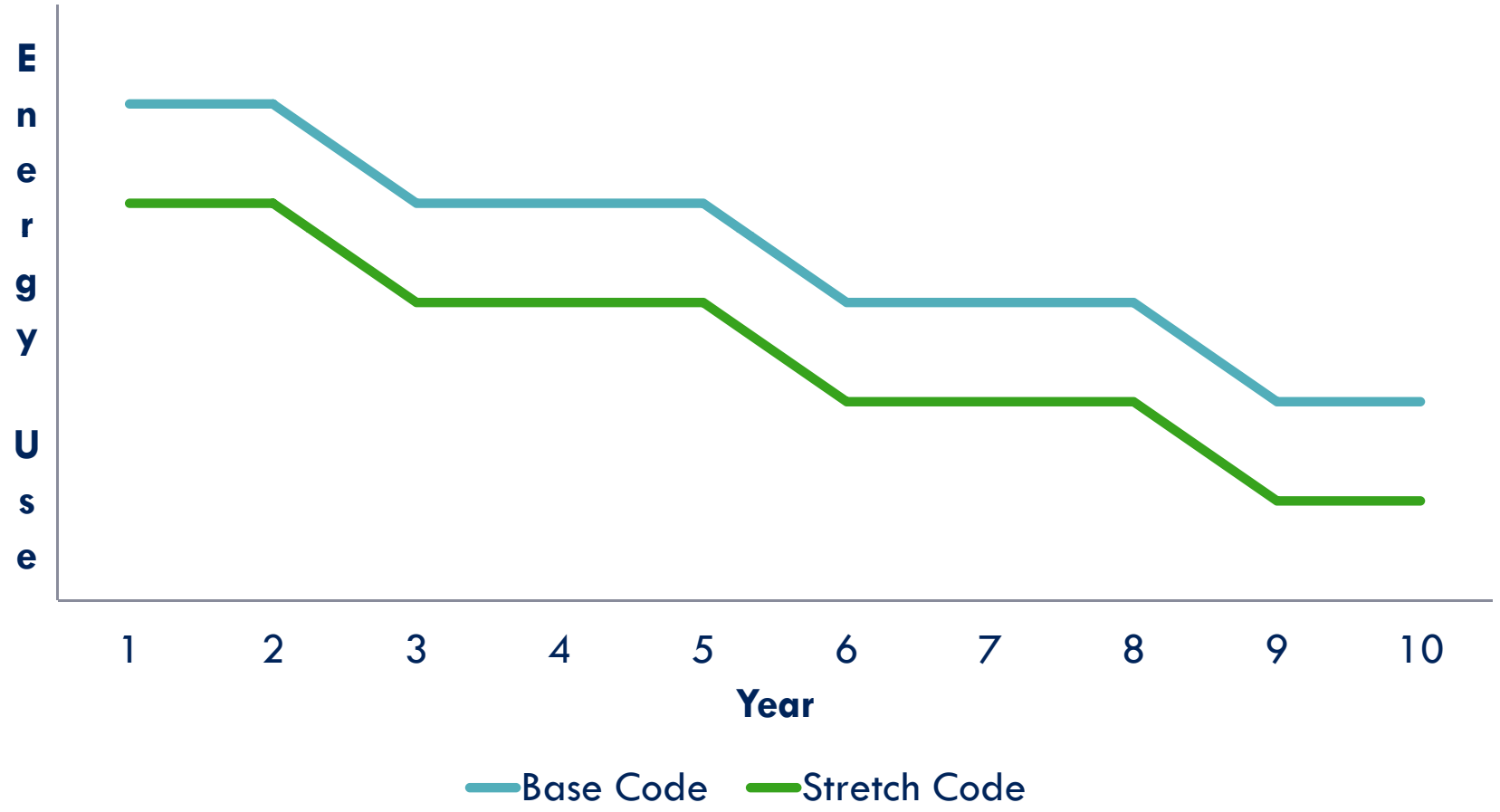
Base & Stretch Codes Over Time



Stretch Code Development

- Local and state levels in the U.S. and internationally
- Origin influences structure & complexity
  - Municipal jurisdiction tend to take the simplest form given the relative lack of resources to develop much new
    - Usually ENERGY STAR Homes or HERS (with TBIC, other)
  - State-developed stretch codes tend to be more complex
    - Can include commercial buildings
    - Residential with tiers, house size

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Development Examples

- Long Island, NY
  - Towns attempted to "out green" each other
  - 10/13 towns adopted ENERGY STAR Homes standards
  - Latter ones added more stringency based on house size
  - LIPA provided $25,000 as incentive to towns
- Massachusetts
  - Green Communities Act of 2008
  - Residential and commercial
  - Significant state resources put into development, encouragement of municipalities and adoption

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Development Examples con't

- California
  - Grew from measures that didn't pass their cost-effectiveness test
  - Discarded measures compiled into CalGreen
    - Two tier levels at 15% and 20% better than code
    - Serves as an "incubator" for the next version of Title 24
    - 2008, CalGreen was voluntary, but in 2009 it became a "voluntary standard" which was adopted by some municipalities as their stretch code
  - Currently movement to align Title 24 & CalGreen development cycles to make it easier for the building community to plan projects
- South Australia
  - Stretch code for the Lochiel Park development to deliver near net zero energy

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Development Lessons

- Development of stretch codes can be challenging the first time out
- Build upon voluntary utility/PA new construction programs, ASHRAE and IECC
- Dynamic process when it comes time to update the statewide base energy code
- Do the analysis and coordinate with key stakeholder and advocacy groups as the next stretch code cycle is developed

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Jurisdiction Size – Municipal vs. State

- Municipal/county governments can move more quickly
- However…
  - In many states, there must first be state support
  - States provide the economies of scale that the construction sector needs
  - Builders have to adapt to differing regulations
  - Local training and enforcement capacities usually smaller
- Recommendations for success:
  - Cultivate a collaborative and symbiotic relationship between municipal and state
  - Stretch codes can allow for municipal leadership
  - Statewide training and capacity building infrastructure by the state provides a clear link between current stretch codes and future statewide codes, strengthening both jurisdictions.

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Code Officials & Third Party Enforcement

- Layering a stretch code on top of IECC and ASHRAE codes adds to an already high burden on officials
- Opportunity: additional oversight to the construction process
- HERS Raters
  - Builder guidance throughout construction
  - Code official has the support of an energy professional
  - Diagnostic testing
  - Compliance vs. enforcement
- Non-residential options

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Program Administrators

- "PAs" are in a good position to play a key role
- In most locations where stretch codes have been adopted, PAs have facilitated the development of an infrastructure of HERS raters, engineering firms, others
- Support of ENERGY STAR Homes or the USGBC LEED for Homes program, has, in many cases, enabled the adoption of stretch codes
- On the other hand, locations without a history of PA engagement and support of new construction programs may lack the infrastructure

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PA Issues

- Increased participation in programs
  - Free marketing and promotion for new construction programs
  - A strategy for market transformation
  - Easier to advocate for stretch code if no financial burden on builders
- Payment of incentives
  - In some jurisdictions (e.g., LI), the PA cannot pay out incentives for building "to baseline code"
  - Massachusetts and California: avoid dissuading municipalities from adoption by paying the same incentives in all towns
- Claiming savings
  - Paying of incentives generally aligns with the claiming of savings

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Whole Building Design

- Opportunity to greatly simplify the code language by moving into modeling software tools
- Stretch codes can play a major role
- New technologies and design paradigms
- HERS, ASHRAE Appendix G
- Internationally, the UK Code for Sustainable Homes and Australian Nationwide House Energy Rating Scheme software are both used in building code applications

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Where to Set the Bar

- Local priorities and encouraging emerging technologies
  - Massachusetts: TBIC, sealed combustion HVAC
  - Long Island: combustion safety test
  - Colorado: house size
  - Oregon: Passive House
- Modeling and analysis of costs and benefits
- In many jurisdictions, larger homes require a lower (better) HERS rating
  - Determining the house size threshold/HERS rating balancing act
  - At least Massachusetts, Boulder County, Boulder City, and Southampton, NY all have requirements for better HERS scores for larger homes.

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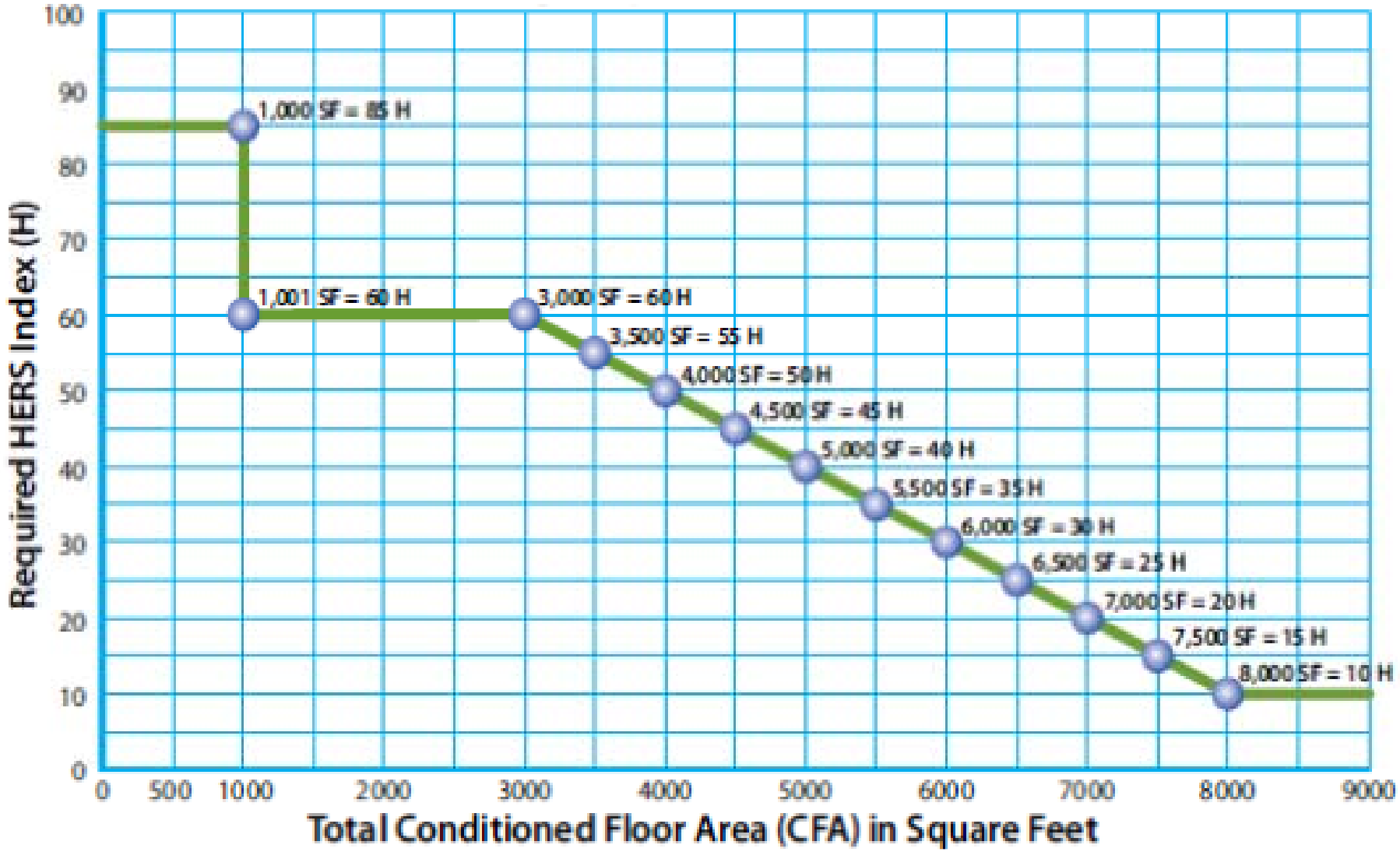
Boulder County's HERS Index Requirements Based on House Size



Additions and Renovations

- Many stretch code jurisdictions also have separate standards for renovations/remodels and additions
- Follow IECC requirements
- Boulder County:
  - Graduated HERS Index requirement for additions
  - Ratings better than a HERS 80 required for additions over 3,000 square feet
- Massachusetts:
  - Renovations: easier HERS standards than new construction or additions
  - Easier prescriptive path option

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Influencing National Codes

- Stretch codes can inform and influence ASHRAE and IECC
- Practical demonstration of higher energy code performance helps reduce national opposition
- While California codes have influenced national model codes for many years, the reach codes in California now inform the Title 24
- Massachusetts commercial stretch energy code forming the basis for the IECC 2012 update
- Oregon and Washington codes also playing a role in the development of the IGCC
- Stretch codes will continue to play an important demonstration role for the next generation of energy codes

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Case Studies

- Massachusetts (2008)
- California (2009)
- See paper for details

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Description and Features of Selected Stretch Code Jurisdictions

- Jurisdictions:
  - City of Boulder, CO
  - Boulder County, CO
  - California
  - Long Island, NY
  - Massachusetts
  - Santa Fe, New Mexico
  - Oregon
- Features:
  - State or Jurisdiction
  - General Description
  - Applicability
  - Delivery Infrastructure
  - Local Baseline Energy Code
  - Stretch Code Level
  - Contact / Information

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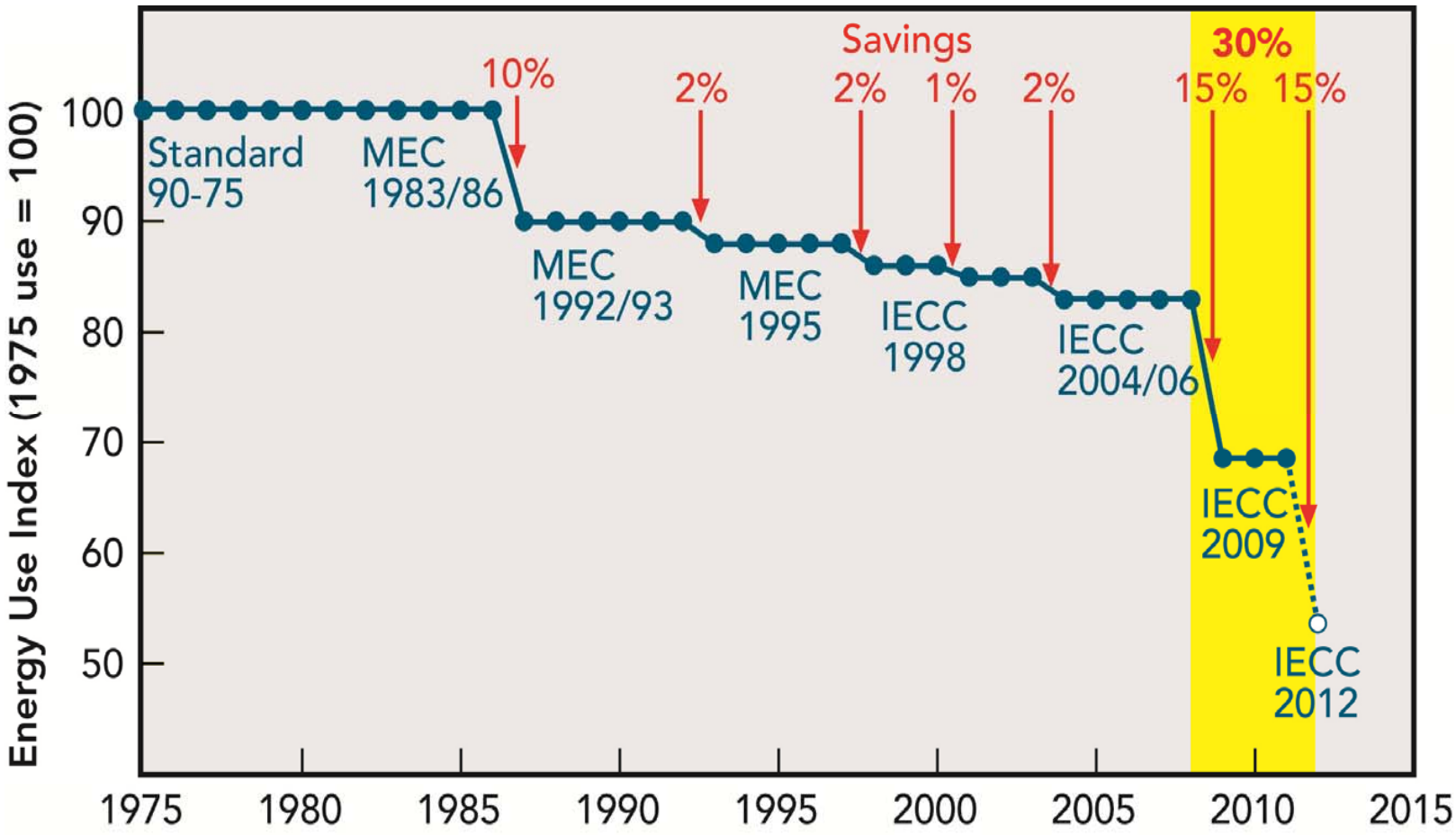
Energy Code Trends



Source: PNNL

Q&A

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