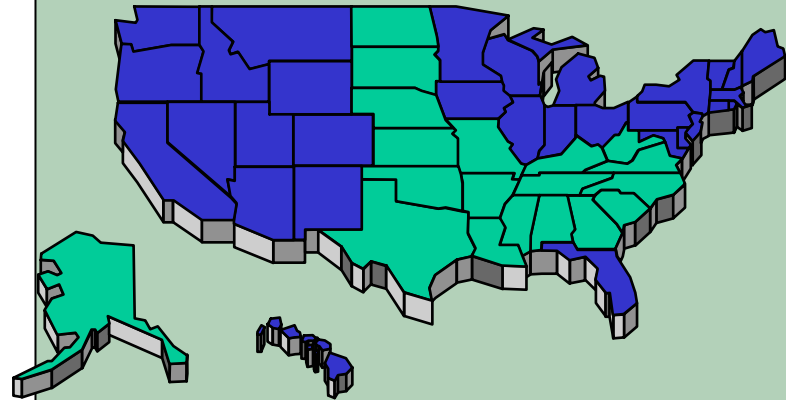


Codes and Beyond Codes

David Hewitt
Executive Director
New Buildings Institute

New Buildings Institute

- Non-profit, think tank on building energy efficiency
- Formed in December 1997
- Funding
 - Sponsors: includes CEC, SCE, NYSERDA
 - Grants: EPA, EF
 - Contracts: USGBC, AIA, CEC PIER, etc.
- Staff in Seattle, Portland, Vancouver, and White Salmon



 **Institute Partners**

National Actions for Low Energy Buildings

- 2030 Challenge - AIA, US Conf. of Mayors
 - 50% reduction in fossil fuel used by new and renovated buildings now; subsequent 10%/yr improvement
- ASHRAE - Model code 30% better by 2010
 - Collaborating on the development of design guidelines for 50% energy savings, with IESNA, AIA, USGBC
- USGBC – Strong market traction
 - LEED now requires energy performance requirements of ~15%, potentially increasing in the future
- EPACT 05 – incentives for designs using 50% less energy than 90.1 -2001

State and Local Actions

- California Big, Bold Initiative
- States with requirements for state buildings
- States developing codes beyond model codes
- States developing incentives for ee buildings
- Cities developing requirements/incentives

Common Theme

Moving the energy efficiency of buildings 20% to 30% beyond any current model code ASAP at the state and local level.

Common Issue

How can efficiency programs work with advancing requirements?

- Threat?
- Opportunity?
- What should programs do?

The New Strategies

- GT50 Summit - National forum to determine how to rapidly accelerate low carbon buildings. It can be done, put policy carrots and sticks needed
- “Code Plus”
- “Informative Appendix”
- “Play or Pay”
- Measured Energy Savings
- Emerging Technology Codes and standards in the utility portfolio

“Code Plus” or Energy Performance Standard

- Establish a code that references ASHRAE 90.1- 2004, plus 30% more efficiency
- Already in use in several states for state buildings and schools. SWEEP pushing as a code upgrade
- Many states also reference LEED
- 95% of buildings less than 50,000 square feet- do they need to model?

“Informative Appendix”

- Sets a future code level in advance
- Intent is to use the “future code” as the basis for incentive programs now
- Directly aligns commercial construction program with codes
- Market is informed, technology/practices more available with prescriptive base
- NEEP and BECAP doing work in this area

“Play or Pay” or Mini-CAP

- Requires developers/owners to either meet a specified energy efficiency level
 - or
- Pay into a green building/ee fund to get equivalent savings elsewhere locally
- May be set as high as 2% of building value
- “Players” can leverage other incentive funds/ programs

Need to Make Compliance Pathways Straightforward

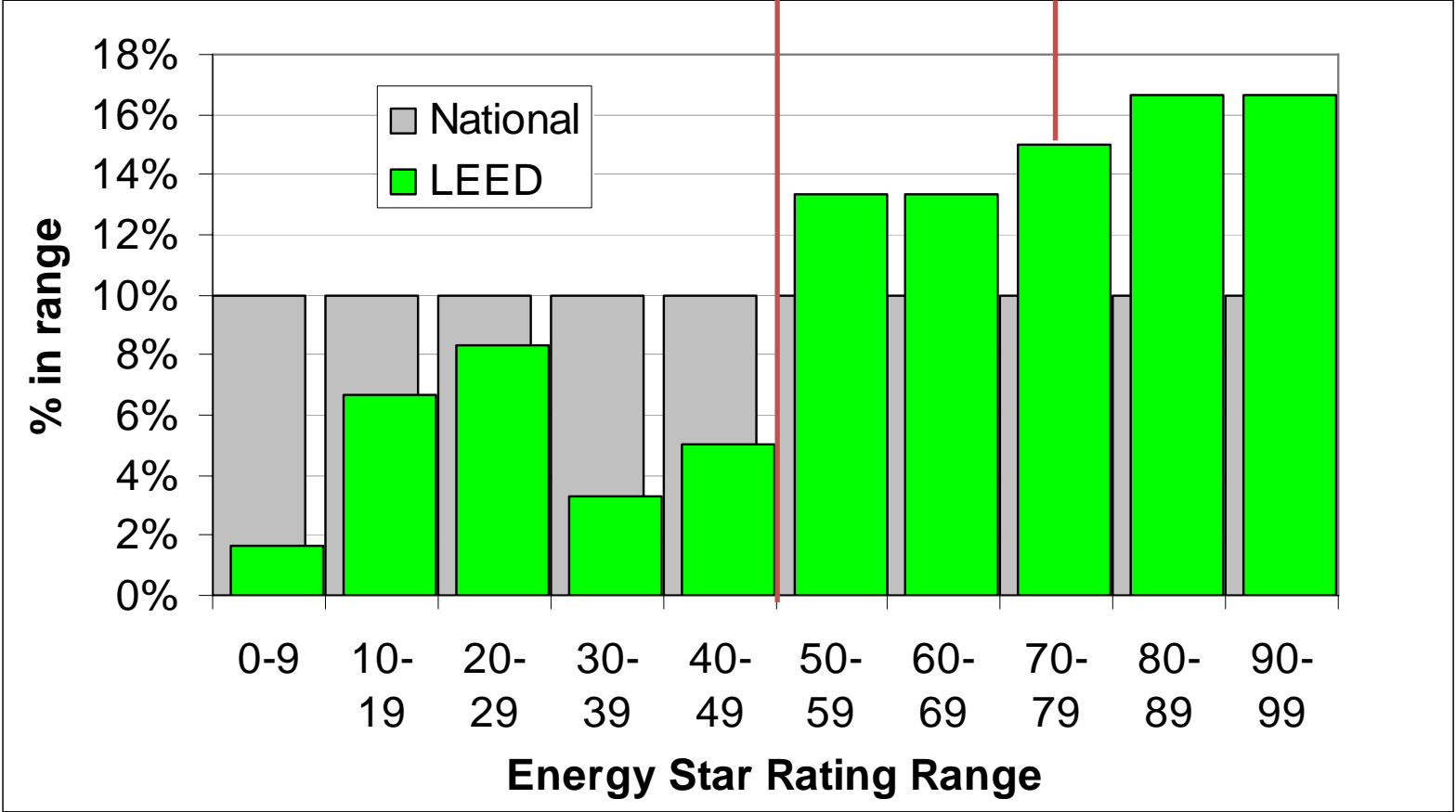
- Need for prescriptive pathways
 - Modeling may be \$10,000 or more per building
 - Modeling compliance? Accuracy?
- NBI's Core Performance frequently referenced
 - Prescriptive path, 50,000 modeling runs, 20% to 30% + savings for most building types.
 - Recognized by LEED for 2 to 5 EA1 points
- Can you go to measured performance for beyond code?

Measured Performance

- 2030 Challenge and EPA Energy Star reference measured performance values.
 - Still need a design tool
- Measured requires time after construction is complete; adds to administrative complexity
- How does Measured Performance compare with modeled?

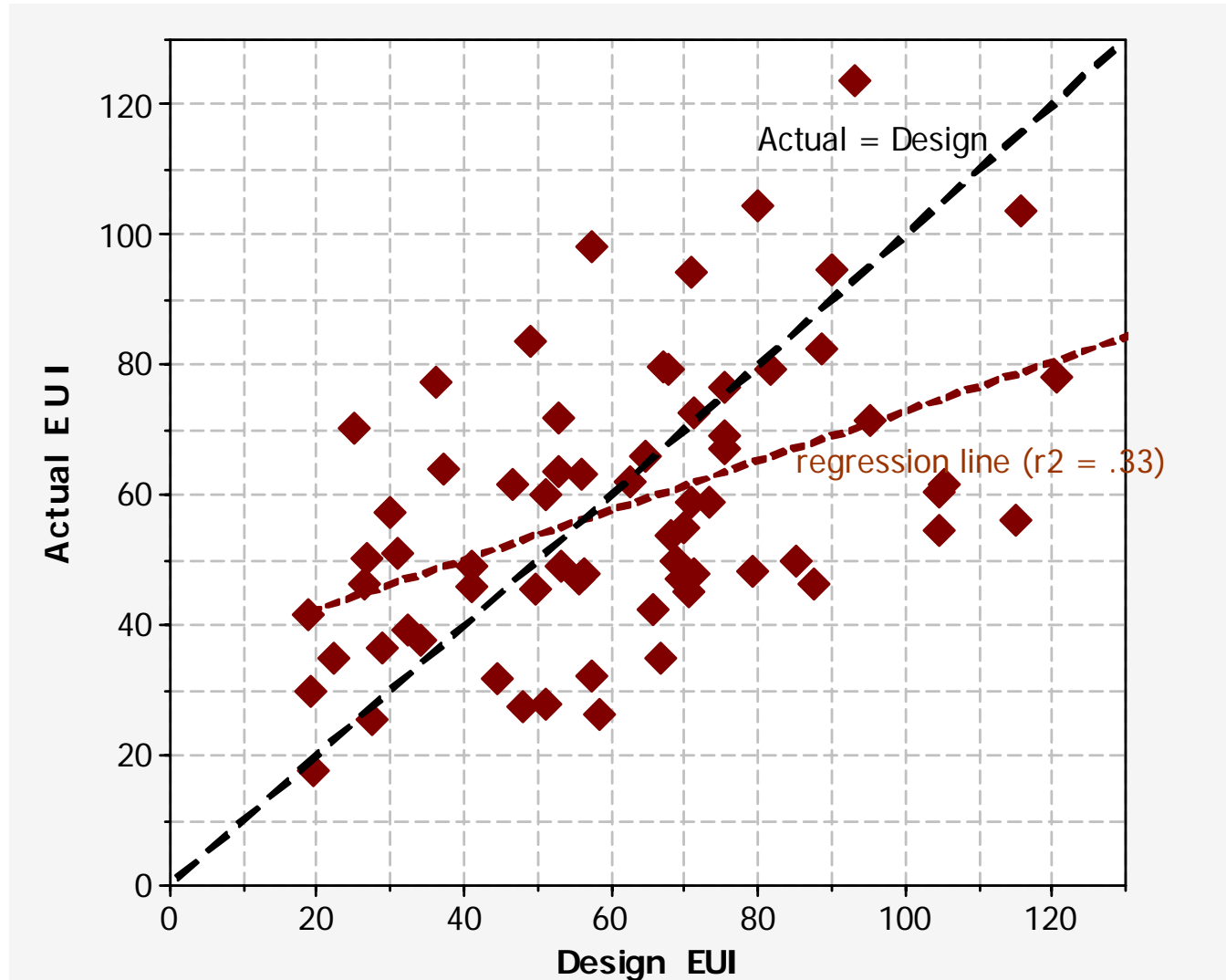
Measured Data

Energy Star



Energy Star Rating Distributions: LEED v National

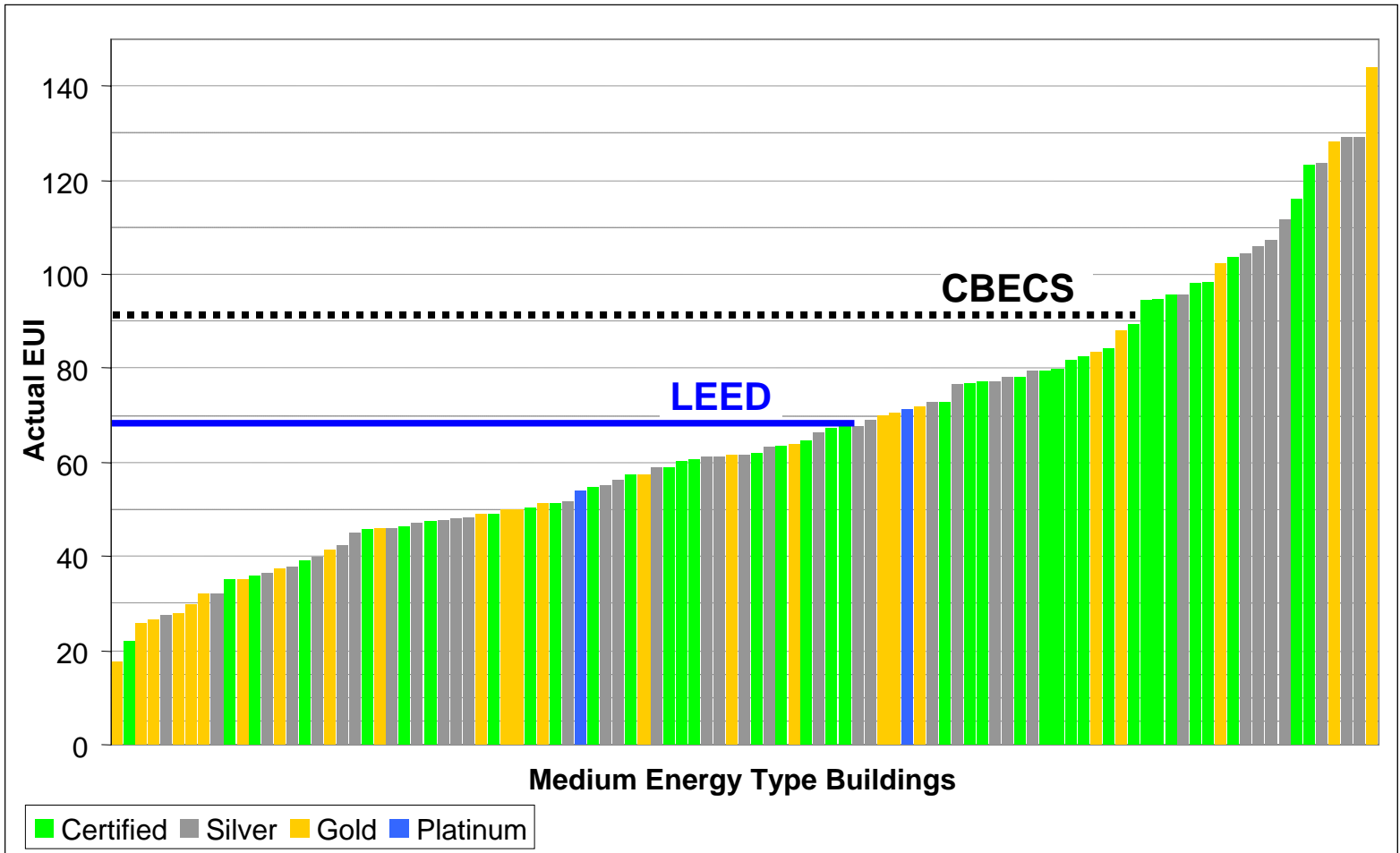
Actual and Design EUI Scatterplot



Modeling

Measured Data

EUI

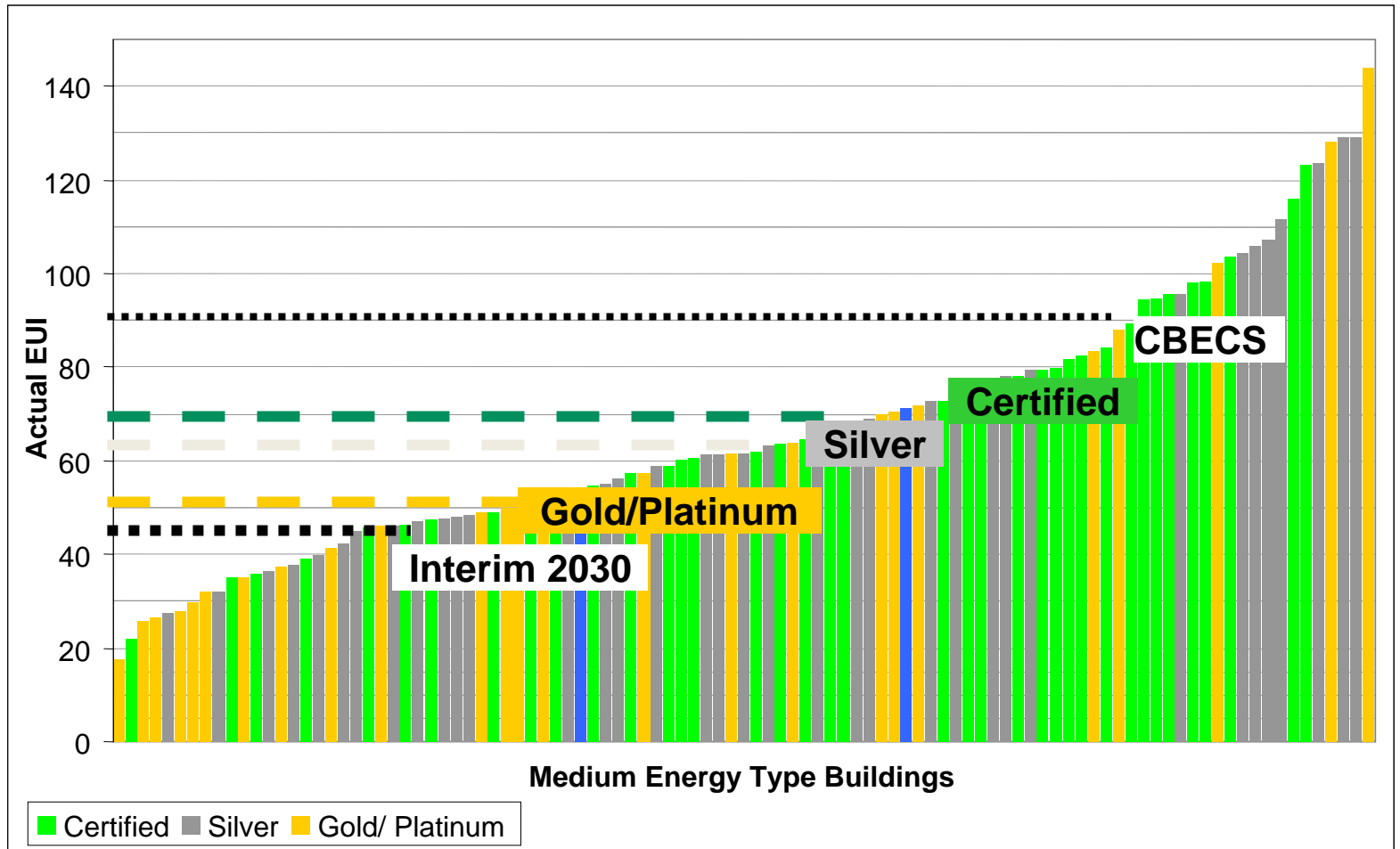


Median EUI Reduction ~25%

Actual EUIs (Medium Energy Types)

Measured
Data

2030



Gold/Platinum Buildings
Approach Interim 2030 goals

NBI's Continuing Work on Performance Measurement

- Built into Core Performance
- Follow-up work w/ USGBC
- Work with CIEE on case study templates
- New grant from EPA on extracting more meaningful data from energy bills/ metering
- National Measured Performance Workshop
- Steering Committee developed; New ASHRAE Committee

Findings from NBI's work in building efficiency

- 30% gains beyond code are “state of the shelf”, readily doable in most buildings, can be prescribed.
- 50% gains are uncommon but doable
 - fewer than 1 in 1,000 new buildings reach this level of efficiency
 - It is possible across multiple building types, multiple climate zones, multiple design teams
 - Top measures are daylighting, advanced controls

Summary

- Major policy pressure to upgrade codes
- Several distinct strategies. “Play or Pay” and “Informative Appendix” have clear roles for ee programs; can support program strategies short-term with substantial gains
- “Easy” energy savings for new construction programs will disappear

Recommendations

- Engage in the advanced codes process
- Consider developing a codes/standards end of DSM portfolio
 - Regulatory treatment is key
- Need to develop the next round of savings from integrated strategies. NBI focused on
 - CLI, daylighting, controls
 - Low-energy HVAC systems
 - Climate based design/ integrated design

www.newbuildings.org

Thank You
David Hewitt
New Buildings Institute