"A Carrot and a Stick" – Using Home Energy Ratings to Improve Energy Code Performance

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Presented By:
Tom Hamilton
Executive Director
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California Home Energy Efficiency Rating System, Inc. (CHEERS®) History

- 501 (c) 3 statewide non-profit
- Incorporated in October 1991
- Energy Efficiency Service Company
- Approved by California Energy Commission
- Accredited by NASEO/RESNET
- Development of C-HERS

Overview of the Process

- From the Beginning
  - Why is verification needed?
    - Who wants it?
    - How do you do it?
- Current Environment
- What is on the Horizon?

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From the Beginning

- **Title-24 (CA Energy Code)**
  - **Energy Standard for California**
  - **California is divided into 16 Climate zones**
  - **Homes must meet specified energy budget**
  - **Title-24 implemented in early 1980's**
  - **Revisions occur every 3 to 4 years**

Title-24 Process

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- Home “modeled” using approved software
- Software creates energy budget for home, produces CF-1r that must be submitted to the building department with the plans for permitting
- Home is built

Why is Verification Needed?

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- Ensure the home is built as designed
- Quality Assurance
  - All measures are quality assured somewhere in the process
  - Except Air Distribution Systems
    - Ducts are built on site
    - Number of studies have indicated significant energy loss due to ducts leaking

Who wants Verification and how do you do it?

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- Who wants it – initially everyone except builder community
- How do you do it?
  - Based upon Completed studies
  - Significant support by Utilities
  - Identification of appropriate firms to complete verifications
    - 3rd party verification
    - Self-certification

Implementation of CHEERS in Energy Code Compliance

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- Guidelines developed by a number of stakeholders (Chap. 4 of Residential guidelines)
- Determination of the benefits and how to implement
  - 1998 Title-24 Alternative Calculation Method (ACM)
    - Allow builder trade-offs for 3rd verification

CHEERS Issues to overcome 'Dispelling the Rumors'

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- Impact on building process
  - Creation of C-HERS
- Number of Certified raters
  - Training protocols
- Tracking system
  - Managing extremely large databases
    - CHEERS Registry (Web based)
- Quality Assurance by HERS provider

California Energy Crisis of 2000

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- **In the summer of 2000, California experienced rolling blackouts in the state and electricity bills in San Diego that went up by 200-300%. At the close of the 2000 legislative session, the legislature responded to the crisis by passing AB 970, and urgency statute that became effective in September 2000.**

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HERS Verifiable Items

- **Reduced duct surface area**
- **Duct Sealing**
- **Envelope sealing/reduced infiltration**
- **ACCA Manual D duct design**
- **Envelope sealing/reduced infiltration**
- **Tested refrigerant charge and airflow**
- **Thermostatic expansion valves (TXV)**
- **ENERGY STAR®**

AB 970

- Became effective June 1, 2001
- Included two approaches for builders to use for complying to the energy standards.
  - Package D
  - Alternative Package D

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AB 970 – Package D

Climate Zone	Radiant Barrier	Maximum Fenestration U-Factor	Maximum Fenestration SHGC	Duct Sealing	Charge & Airflow Testing or TXV
1	-----	-----	------	Required	-----
2	Required	0.65	0.4	Required	Required
3	-----	-----	-----	Required	-----
4	Required	0.75	0.4	Required	-----
5	-----	-----	-----	Required	-----
6	-----	-----	-----	Required	-----
7	-----	0.75	0.4	Required	-----
8	Required	0.75	0.4	Required	Required
9	Required	0.75	0.4	Required	Required
10	Required	0.65	0.4	Required	Required
11	Required	0.65	0.4	Required	Required
12	Required	0.65	0.4	Required	Required
13	Required	0.65	0.4	Required	Required
14	Required	0.65	0.4	Required	Required
15	Required	0.65	0.4	Required	Required
16	-----	-----	-----	Required	-----

AB 970 Alternative Package D

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Climate Zone	Maximum Fenestration U-Factor	Maximum Fenestration SHGC	Equipment Efficiency
1	0.55	-----	90% AFUE
2	0.4	0.35	-----
3	0.55	-----	-----
4	0.4	0.35	-----
5	0.55	-----	-----
6	0.55	-----	-----
7	0.4	0.35	-----
8	0.4	0.35	-----
9	0.4	0.35	11 SEER
10	0.4	0.35	11 SEER
11	0.4	0.35	12 SEER
12	0.4	0.35	11 SEER
13	0.4	0.35	12 SEER
14	0.4	0.35	12 SEER
15	0.4	0.35	13 SEER
16	0.55	-----	90% AFUE

Properties Affected by AB 970

- Single – Family
- Low – Rise Multifamily
- High – Rise Multifamily
- Small commercial buildings

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The Future
2005 Standards Update

- Make them more sensitive to the time dependence of energy use;
- Increase the quality of construction and reliability of energy savings;
- Address new opportunities to include emerging technologies and research conclusions from the Commission's Public Interest Energy Research (PIER) Program

2005 Standards Update

- Identify strategies to redress compliance problems that put the industry at risk for construction defect or code defective liability litigation
- Address replacement window and other measures to improve the energy efficiency of existing buildings at the time of building alterations
- Develop a cost-effectiveness and performance standards methodology that recognizes time dependent valuation
- Develop strategies for how air conditioner sizing could be effectively addressed in the 2005 Standards

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Improvements for Existing Homes

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- Seeks to explore the feasibility of requiring duct efficiency improvements at the time of HVAC equipment replacement and window efficiency requirements at the time of replacement
- The justification for this measure is that the market that would be affected is potentially enormous as it could encompass much of the HVAC and window replacement markets in California

Lesson's Learned

- Won’t happen overnight, however it is possible
- Know the market actors involved in the process
- Understand the process and implement a process that is seamless

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