

A Look at ENERGY STAR® Homes Across the USA

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Outline

- **Overview of the MA Program**
- **What We Wanted to Know**
- **What We Learned**

MA Program Sponsors

- **Electric IOU's**
- **Gas IOU's**
- **Energy Services Providers**

2007 Participation Paths Residential New Construction

- **ENERGY STAR Homes**
 - Performance/HERS Index
 - Prescriptive/Builder Option Packages (BOP)
- **CODE PLUS/Energy Savings Measures**
 - Duct Sealing, Air Sealing, HVAC Equipment,
 - High Performance Insulation & CFLs

Wanted To Know

- How other programs are dealing with the new EPA requirements for ENERGY STAR certification.
- Work conducted by Nexus Market Research (Spring 2006).

Items of Interest

- Duct leakage standards
- Thermal Bypass Inspection Checklist
- Federal tax credit
- BOP participation path
- Residential new construction market leveling off

How We Gathered Data

- In-depth interviews with sponsors of ENERGY STAR Homes programs in other areas (9), organizations in potentially complementary areas (9), and other knowledgeable parties (3).

Program Sponsors Interviewed

- Pacific Gas & Electric (California programs)
- Portland Energy Conservation, Inc. (Northwest programs)
- ICF International (Texas programs)
- MidAmerican Energy (Iowa programs)
- Wisconsin Energy Conservation Corp. (Wisconsin programs)
- New York State Energy Research and Development Authority (New York programs)
- MaGrann Associates (New Jersey programs)
- Vermont Energy Investment Corp. (Vermont programs)
- United Illuminating

Potentially Complementary Organizations Interviewed

- Green Building
 - National Association of Homebuilders
 - US DOE—Building America
 - Masco Contracting Services—
 Environments for Living® Program
 - Green Roundtable (based in Boston)
 - Builders Association of Greater Boston
 - MassHousing

Potentially Complementary Organizations Interviewed (continued)

- Sustainable Development
 - US EPA—Smart Growth Program
 - Massachusetts Department of Housing and Community Development
- Healthy Homes
 - New England Asthma Regional Council

Other Organizations Interviewed

- US EPA—ENERGY STAR Homes Program
- Consortium for Energy Efficiency (CEE)
- Northeast Energy Efficiency Partnerships, Inc. (NEEP)

What We Found

ENERGY STAR Homes Programs in Other Areas

Marketing and Outreach

- All market to both builders and consumers
 - Some primarily to builders, other to consumers
 - One-third of Wisconsin's budget goes to marketing—including a lot of co-op advertising
 - All but the Iowa program have dedicated field or outreach staff
 - All market to all types of builders
 - All have websites
 - Most work closely with local Home Builder Associations

Identifying Potential Builders

- **California (PG&E) and Wisconsin market through independent energy consultants (HERS raters)**
 - **Under new California energy code everyone required to hire a building energy consultant to certify that code is met**
 - Energy consultants recommend the program to builders and consumers inclined toward energy efficiency
 - **Wisconsin works with more than 50 consultants (HERS raters) who market the program and their services to builders**
 - Consultants work closely with Home Builder Associations
 - Consultants compete for builders—need to keep the builder happy to keep his business
 - Over 80% of homes from four or five Consultants

Biggest Recruiting Challenge

- Convincing builders to participate
 - They think they are already building energy-efficient homes
 - Not having problems selling their homes
 - Consumers not demanding energy-efficient homes
 - Increased cost
 - Hassle of more paperwork and/or inspections
 - Confusion over new certification requirements and tax credits—What qualifies for what?

Other Barriers to Participation

- Hard to sustain technical training in the construction trades because of high turnover rates.
- As production builders sub out more work the more removed they become from the building process, and cost becomes the main driver in decision making.

Participation Paths

- Performance Path (HERS) only
 - Vermont, New Jersey, Wisconsin, California, Texas
- BOP Path only
 - Northwest
 - Offers HERS training to builders interested in federal tax credit
 - Negotiating with RESNET to develop a BOP-based approach for the tax credit
- Both
 - Iowa, New York, Connecticut, MA

Duct Sealing and Air Infiltration

- Six programs offer training on proper duct sealing
 - California, Northwest, Texas, New Jersey, Connecticut (UI), MA
- Three address leaky cabinets
 - Northwest, Connecticut (UI), New Jersey
- All but Iowa and the Northwest provide air sealing training
- New Jersey requires a preconstruction meeting/training with the builder and subcontractors on every project. If the builder changes subcontractors during the project they set up another meeting.

Prior Air Infiltration and Duct Leakage Requirements

- **All but Texas and Connecticut (UI) had prior air infiltration and/or duct leakage requirements**
 - Vermont—duct sealing requirements
 - Iowa—duct leakage requirements
 - Wisconsin & MA—air infiltration requirements
 - New Jersey targeted (not required for certification) duct leakage and air infiltration levels
 - California, New York & the Northwest—both duct leakage and air infiltration requirements

HVAC Sizing & Performance Testing

- **Two programs do not offer HVAC training**
 - Vermont and Connecticut (UI)
- **Two programs provide training & performance testing**
 - California and Northwest
- **Three programs provide training or discuss with builders but do no performance testing**
 - Texas, Iowa and New Jersey
- **New York provides training and conducts quality installation and operation inspections at 10% of installations**
- **In Wisconsin, HVAC training and performance testing conducted through HVAC program**

Saving Estimates

- **Four programs use REM/Rate**
 - Wisconsin, New Jersey, New York and Connecticut (UI))
- **California—CPUC-approved E3 Calculator**
 - Estimates savings based on avoided costs
- **Northwest—local expert with proprietary software**
- **Vermont—based on prescriptive measures**
 - Also have three groupings of HERS ratings and claim savings based on the number of homes in each group
- **Texas—predictive savings tool from ICF**
 - Not based on avoided cost—calculates kW and kWh savings
- **Iowa—deemed savings**
 - number of measures installed multiplied by approved savings per measure
 - Savings modeled every five years and approved by regulators

Incentives

- **Making comparisons is tricky (\$100-\$5000)**
 - **Some programs include rebates for HVAC equipment, appliances and/or lighting through program**
 - **Some offer HVAC equipment, appliances and/or lighting rebates through other programs**
 - **Some offer no equipment or appliance/lighting rebates**
 - **Some cover the cost of inspections and HERS ratings, others do not**
 - **Some offer up to several thousand dollars of co-op advertising per year**
 - **Some offer sizeable incentives for model homes on display for an extended period**

Incentive Levels

- **Incentive range (per home)**
 - \$150 plus HERS rating (Texas) to over \$5,000
- **Incentive examples**
 - **Iowa:** GSHP homes \$300/ton up to \$4,000 plus \$1,500 base incentive
 - \$2,250 base incentive for non GSHP HERS homes with CAC
 - **New Jersey:** \$500 + \$.60/sq. ft. up to \$2,900 base incentive
 - **New York:** Up to \$3,000 for model homes open for 60 days
 - \$750 to \$1,250 base incentive based on expanded HERS score
 - **Wisconsin:** Up to \$3,000 a year in co-op advertising
 - \$200 base incentive first three homes - \$100 each after
 - (builder pays for HERS rating)

Incentive Levels (cont.)

- Four programs lowered incentives without affecting participation
 - Texas, Wisconsin, New Jersey and Connecticut (UI)
- New incentives being offered
 - Gas clothes dryers
 - Renewable friendly homes
 - ECM furnaces
 - Duct sealing
 - Duct insulation upgrades

Non-ENERGY STAR Incentives

- **Three programs offer prescriptive HVAC equipment, appliance and/or lighting rebates**
 - California, Connecticut (UI), Vermont
- **Iowa offers two BOP paths**
 - Traditional and 2006 ENERGY STAR
 - Same base incentive to give builders time to reach new requirements

Impact of New Requirements on Participation

- **Seven of nine programs expect participation to drop**
 - Iowa expects participation in ENERGY STAR paths will drop, but builders will stay under their traditional, non-ENERGY STAR BOP option
- **Two programs do not expect the changes will have much of an impact on participation**
 - New York and Wisconsin

Response to New Requirements

- **Changes some programs have made**
 - Added participation paths
 - Provided more training and education
 - Encouraged builders to install ducts in conditioned space
 - Encouraged use of better insulation materials and technologies
 - Revised inspection process
 - Revised requirements for qualified electric savings
- **Two programs seeking policy changes from EPA**
 - California and Wisconsin

Response to Federal Tax Credit

- Programs not pushing builders to pursue federal tax credit and do not see it having much impact on participation
 - Most programs will do the certification and provide the report required for the credit
 - Northwest negotiating with RESNET for a BOP-based approach for the tax credit
 - New York developing a “Best of the Best” ENERGY STAR path that qualifies for the tax credit
 - Wisconsin finding some builders going for tax credit over ENERGY STAR
- Six programs see high builder interest
 - California, Northwest, Vermont, Wisconsin, Iowa and New York
- Three programs see little interest
 - Texas, New Jersey and Connecticut (UI)
 - Once builders find out what is involved they back off—it seems unachievable and too costly

Linkages with Other Programs

- Most programs work to at least some degree with other residential construction programs
 - **LEED-H pilot—Vermont and New Jersey**
 - **Local green building programs—Iowa, New Jersey, Texas, Northwest and Connecticut (UI)**
 - **Share information**
 - **Collaborate on recruiting builders and providing education**
 - **Sponsor mutual events**
 - **Green programs promote ENERGY STAR in messaging**
 - **ENERGY STAR certification minimum requirement for green rating**
- **California and New York—no formal contact with other programs**
- **Wisconsin—frustrated and claims “green washing”**

New Home Market

- **Most programs seeing some slowdown**
 - Nothing dramatic
- **Most (six of nine) think slowdown will make builders more interested in building ENERGY STAR homes**
 - Allow them to differentiate their homes
 - If consumer awareness increases, the ENERGY STAR label value increases
- **Three (Iowa, New Jersey and Connecticut (UI)) think some builders will be more interested in building ENERGY STAR homes and others more interested in cutting costs**

“Responses will vary—some builders are committed to building ENERGY STAR homes, some participate because of the benefits and breakeven incentives, and others could probably care less.”

Where Programs Are Headed

- **Incorporating some green building practices**
 - Vermont, New Jersey, Northwest and California
 - California likely to focus on solar options
- **Wisconsin introducing renewable-ready homes**
- **New York—introducing a “Best of the Best” ENERGY STAR marketing plan**
 - Homes will qualify for tax credit
- **Texas most pessimistic—program will downsize and participation will drop**
 - Most savings from air conditioning and these hit hard by new SEER 13 standard
 - They can only claim electric savings
 - As of year end they have been able to get builders to install high efficiency CAC and maintain participation
- **“Get back to me on that, there is a lot happening.”**

Assessing Progress Toward Market Transformation

Seven Questions Asked

Is someone making money by offering it?

- *Can/would builders make money by building ENERGY STAR-certified homes without individual regional program support—only the EPA providing the label?*
- **Some builders, but not many, can profit from it if they market properly (one interviewee calls them “a small critical mass”). On a national level, builders can profit once systems are more commercialized and subcontractors are better trained.**

Has a private market developed to continue the facilitation?

- *Will builders/sales agents continue to market energy-efficient homes without individual regional program support?*
- Builders may well market new homes as “energy-efficient,” but that does not mean they would meet ENERGY STAR standards. “(Without ENERGY STAR) there is no single, easy way for a consumer to know if their home is energy efficient.” Interviewees also consider getting sales agents to market the benefits of energy efficiency to be a major challenge.

Has the profession or trade adopted it as standard practice?

- *Are energy efficient homes now a mainstream option?*
- **Yes, the housing units signing up for the program reached 20% of the total unit permits issued in Massachusetts in 2005.**
- **The baseline study found that 13% of non-ENERGY STAR homes could meet the new envelope and duct leakage requirements for ENERGY STAR certification in Mass. Thus, energy efficiency is the standard for 20% to 30% of new homes and, therefore, could be considered a mainstream option.**

Would it be difficult or costly to revert to earlier equipment or practices?

- *Would builders who currently build to ENERGY STAR standards revert to standard practices without individual regional programs?*
- **Most builders say they will likely continue to use the improved building techniques they learn through the program, but are not likely to have their homes rated and certified without incentives.**

Are end-users requesting or demanding it?

- *Are homebuyers requesting or demanding ENERGY STAR homes? Would there be sufficient consumer demand without regional program support?*
- **Some, but probably not nearly enough to make the market sustainable on its own. While consumers are becoming more concerned about energy efficiency—especially in light of high energy prices—ENERGY STAR homes are probably not “branded” enough to sustain builder practices.**
- **Builder interviews showed very few builders saw an increase in buyer interest in energy efficiency.**

Have the risks to private market actors been reduced or removed?

- **To date there has been little, if any, risk in building ENERGY STAR but a flat market may entail some risk in recouping additional costs.**
- **Multifamily developers strongly believe that a glut in new housing will bring home prices down rather than lead buyers to demand energy efficiency. They believe that only a steep rise in energy prices would affect the latter.**

Are purchasers satisfied?

- **Yes. In addition to savings, home buyers value quality, comfort, and durability, which are also features of ENERGY STAR homes.**
- **One interviewee points out that the more information home owners have on why and how their ENERGY STAR homes are different, the happier they are.**

Opportunities ENERGY STAR HOMES

- **Areas with savings potential remain in lighting, HVAC - more complete best practices on installation, and duct design,
 - getting ducts inside conditioned space.**
- **Requirement for mechanical ventilation enhances indoor air quality which fits the healthy home image**
- **Program is relatively straightforward - one level of certification.**
- **Program provides third party verification of home construction.**
- **Partnering with Green Building & Sustainable Developments**

Barriers

ENERGY STAR HOMES

- The home sales infrastructure is not geared to marketing energy efficiency and sales agents often lack the knowledge to discuss the benefits of energy efficient homes.**
- Builders are responsible for mold and moisture problems which some fear could result from an “overly tight” house. Builders experienced performance problems with heat pumps and early CFLs.**
- Builders are reluctant to add to construction costs that may not be recouped in a slowing market.**

Barriers—ENERGY STAR HOMES (con't)

- Builders are reluctant to add more inspections to their construction schedules.**
- It is difficult to find trained subcontractors due to high turnover rates in the construction trades and production builders sub out more and more work.**
- Some builders believe their homes are already energy efficient if they meet the code.**
- Builders interested in the tax credit may bypass safety and other ENERGY STAR requirements in favor of the tax credit dollars. (has happened in a few cases in Wisconsin.)**

Recommendations

- Offer an alternative to **ENERGY STAR** certification to encourage exceeding current building code
- Work to establish mutually beneficial relationships with green building programs in the area and incorporate **ENERGY STAR** standards.

Recommendations (con't)

- **Establish a dialogue with BAGB to explore the possibility of incorporating ENERGY STAR certification into the Green Building Massachusetts program.**
- **Continue to work with the LEED for Homes program, setting an example of how ENERGY STAR and green building can be a successful partnership.**
- **Continue to work on linking ENERGY STAR Homes with the healthy homes initiative.**

Recommendations (con't)

- **Long-term transformation of the market for new homes depends on consumer demand.**
- **Consider ways to get consumers to ask for ENERGY STAR homes**
 - **cooperative advertising with builders**
 - **MLS listings**

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