HERS ~ ESH ~ REM
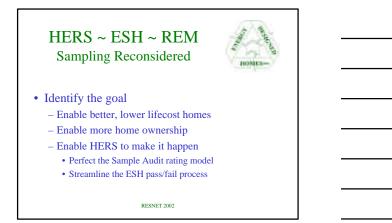### Sampling Reconsidered

- Improve Audit Efficiency
  - If we fail at market transformation, we have failed our goal
  - If we fail to handle the market when it comes …
    we have failed our goal.

- Streamline the Process
  - Identify the goal
  - Continually evaluate the process
  - Objectively rate the results
  - Remember the goal   PDF

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HERS ~ ESH ~ REM
Sampling Reconsidered

- Identify the goal
  - Enable better, lower lifecost homes
  - Enable more home ownership
  - Enable HERS to make it happen
    - Perfect the Sample Audit rating model
    - Streamline the ESH pass/fail process

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HERS ~ ESH ~ REM
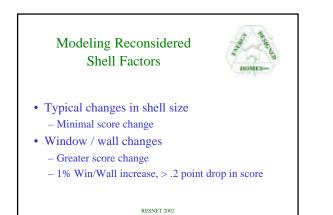### Sampling Reconsidered

- Continually evaluate the Process
  - HERS ratings are gaining market momentum
  - Current business models may not accommodate future volume
  - Sample Audits present opportunities with volume builders

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HERS ~ ESH ~ REM
Sampling Reconsidered

- Questions from this audit project
  - Rating Scores are relatively insensitive
    - To shell size variables
    - To air leak factors
  - Data requirements seem redundant

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Modeling Reconsidered
Shell Factors

- Typical changes in shell size
  - Minimal score change
- Window / wall changes
  - Greater score change
  - 1% Win/Wall increase, > .2 point drop in score

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Modeling Reconsidered
Air Leakage Factors

- 0.35 ACH natural is unrealistic rating parameter
  - Large homes can be barns
  - Builders have no incentive to build airtight
  - Few homes > 0.35 ~ BD testing generally unproductive
  - Minimal Impact (0.2 reduction in score / .05 ACHnat)

- Duct loss issues - unclear if all into heated space
  - Minimal impact (0.1 reduction in score / 50 CFM25)

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Modeling Reconsidered
Worst Case Construction

- ESH Pass / Fail on the given model
  – Base model scored at 88.6
  – With 0.50 ACH natural
  – With 500 CFM25
  – With 50% <u>increase</u> in window area

- Score: 86.3 ~ still an ENERGY STAR HOME!

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Modeling Reconsidered
Streamline ESH pass/fail process

- Current HERS modeling too detailed
  – Shell variables are score stable
  – Simpler win/wall factor only slightly more important
  – Air leakage variable relatively score stable

- Software models show feature not shell efficacy
  – BOPs produce predictable score results

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Modeling Reconsidered
Streamline ESH pass/fail process

- In demonstrating minimum ESH compliance, we can assume most of the data we are calculating
  – Base models can be extrapolated to additional homes

- Rater efforts could be refocused
  – Not on unproductive repetitive tasks
  – On real performance issues, on building better homes

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The Lean Mean HERS Rating Machine

- Develop multiple certification models
  - Sample Audits for consistent Volume Builders
  - Full audit (Lender paid?) for others
  - BOPs … if designed to work not punish   PDF
- Reduce unnecessary data detail
  - Model particular builder or local BOPs
  - Expand to balance of builder's portfolio

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A Lean Mean HERS Rating Machine … for Volume builders

- Develop Sample Audit protocol
  - Baseline Audits   PDF
  - Performance review of audit findings   PDF
  - Design Builder BOP with a score margin
  - Sample 1/7 of homes, HERS diagnostics and inspection
- Computer Model
  - Baseline audits
  - Establish the Builder BOP

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Remember our Goal!

- Enable better, lower lifecost homes

- Enable more home ownership

- Enable HERS to make it happen

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