



HERS 101

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Introductions

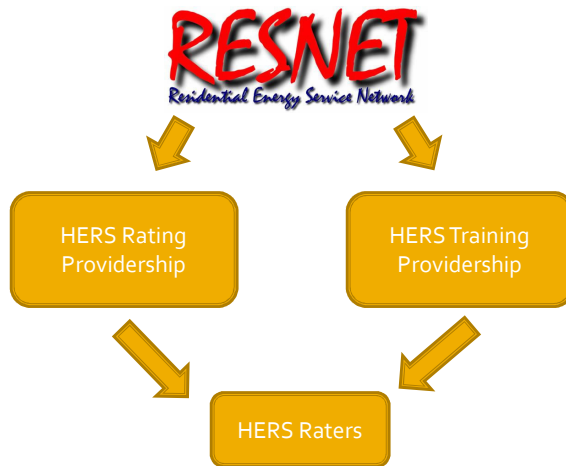
- Audience
 - HERS Raters?
 - Code officials?
 - HVAC contractors?
 - Insulators?
 - Architects?
 - Government employees?
 - Where from?

Agenda



But I'm Open to Other Ways of Doing It

HERS industry



- Energy Star
- Green Building Programs
- Utility Programs
- Home Performance with Energy Star
- BPI

RESNET

The Residential Energy Services Network's (RESNET®) mission is to ensure the success of the building energy performance certification industry, set the standards of quality, and increase the opportunity for ownership of high performance buildings. RESNET is a membership 501-C-3 non profit organization.

www.resnet.us

RESNET

- Board of Directors
- Staff
- Committees
 - Technical
 - Quality Assurance & Ethics
 - Training and Education

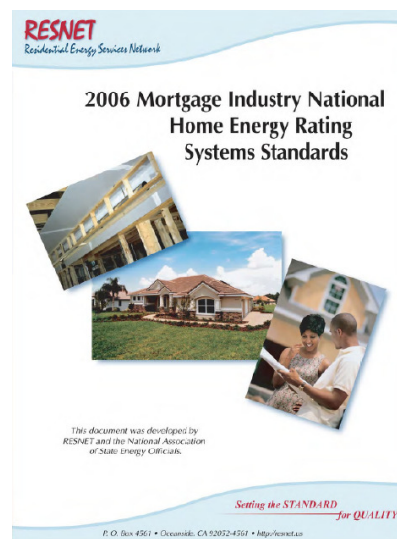
HERS is Recognized by

- Mortgage industry for capitalizing energy efficiency in mortgages
- Financial industry for certification of “white tags”
- Federal government for verification of building energy performance for:
 - Federal tax credit qualification
 - EPA ENERGY STAR labeled homes
 - U.S. Department of Energy Building America program
- Method of minimum code compliance in 16 states

HERS Standards

Rules and regulations:

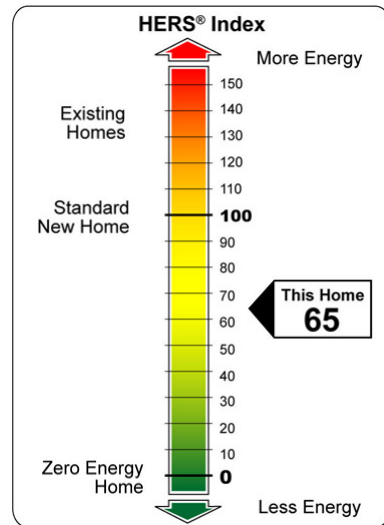
- Raters
- Rating Providers
- Trainers
- Software developers
- RESNET



HERS Ratings

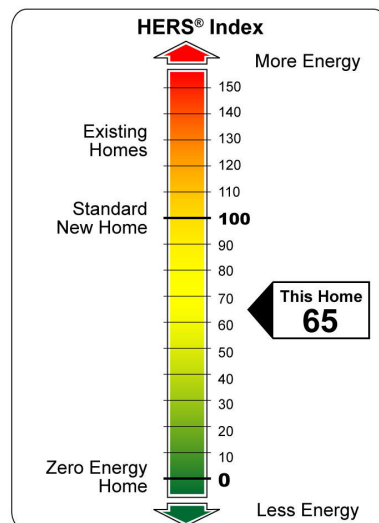
HERS Index of 100 represents the energy use of the "American Standard Building".

HERS Index of 0 (zero) represents a home using no net purchased energy (a Zero Energy Building).



HERS Index

- HERS Index accounts for:
 - Heating
 - Cooling
 - Water Heating
 - Lights
 - Appliances
- Lower is better



Rated vs. Reference Home

Feature	Rated Home	Reference Home
Location	Actual	Actual
Size & Shape	Actual	Actual
Windows	Actual	18% of floor area, evenly distributed
Insulation	Actual	2004 IECC
HVAC	Actual	2004 IECC
Infiltration	Actual	SLA = 0.00048

HERS Training Providers

- Accredited by RESNET
- 27 Training Providers around the country
- A full list can be found here:

<http://www.resnet.us/programs/training/directory.aspx>

HERS Training

- Week long course
- Classroom and field
- HERS Software
- RESNET Rater test
 - 2 hours
 - 50 questions
 - $\geq 80\%$ passing score



Training Topics

- Basic principles of building science (i.e., viewing the home as a system)
- Thermal resistance of insulation materials
- The minimum rated features for buildings
- Blower door testing procedures
- Duct leakage testing procedures
- Variations in construction types and their ramifications
- Types and efficiencies of windows
- Types and efficiencies of heating, cooling, water heating, and lighting systems
- Types and characteristics of space conditioning and domestic hot water distribution systems
- Types of thermostatic controls
- Determination of azimuth
- Determination of air leakage
- Determination of fuels used by major appliances
- Utility rate structures
- On-site inspection procedures
- Producing a scaled and dimensioned drawing of a home
- Calculating the area of rectangles, triangles, circles, ovals and combinations of these shapes
- Calculating the volume of boxes, pyramids, spheres, and other geometric shapes
- Completing a home energy rating checklist or entering data into a home energy rating software program
- Completing a home energy improvement analysis or entering data into a home energy rating software program that performs improvements analysis
- Basic knowledge of financial incentive programs and energy efficient mortgages
- Communicating the benefits of energy saving measures and practices to the consumer
- Quality assurance

<http://www.resnet.us/rater/certified/default.htm>

HERS Rating Providers

- Supplies the Rating software
- Each Rating Provider must employ a certified Quality Assurance Designee (QAD)
- QAD must check a minimum 10% of all building input files
- QAD must verify a minimum of 1% of each certified Rater's homes
- Maintain rater registry, records of CEUs, financial disclosure forms, complaints, etc.
- RESNET ensures Rating Providers compliance



Finding a Rating Provider

- There are ~100 around the country
- Full list here:

<http://www.resnet.us/programs/providers/directory.aspx>

- Tips
 - Find someone reasonably close by
 - Find someone you like working with
 - Ideally the Provider will help you develop your business and supply leads and advice
 - Someone you do not have a conflict of interest

Becoming a Rating Provider

- Be a Rater first
- RESNET non-refundable \$500 application fee
- Annual accreditation fee of \$1,750
- Must have a QAD, which requires
 - performed ≥ 25 Ratings
 - Pass the RESNET QAD Test with $\geq 90\%$ correct
 - Can not check their own ratings

HERS Raters

- HERS Field Analyst
 - Trained and certified to only perform inspections
- HERS Rater
 - Performs inspections **and** HERS software models



Becoming a Rater

- Complete week-long training
 - Accredited by RESNET
- Pass national online test
- Contract with RESNET accredited Rating Provider
- Perform 5 “provisional” ratings under the supervision of certified rater
- Equipment
- Insurance

Rater Code of Ethics

- Professional Conduct
- Representation of Fees & Services
- Conflicts of Interests

Standard Disclosure

- Completed for every home.
- Given to the rating client who is responsible to provide a copy to the home owner/buyer.
- Each form must include, at a minimum, the name of the community or subdivision, city and state where the home is located.

RESNET HOME ENERGY RATING Standard Disclosure

For home(s) located at: _____
 City: _____ State: _____

Check the applicable disclosure(s) in accordance with the instructions on the reverse of this page:

- The Rater or the Rater's employer is receiving a fee for providing the rating on this home.
- In addition to the rating, the Rater or Rater's employer has also provided the following consulting services for this home:
 - A. Mechanical system design
 - B. Moisture control or indoor air-quality consulting
 - C. Performance testing and/or commissioning other than required for the rating itself
 - D. Training for sales or construction personnel
 - E. Other (specify) _____
- The Rater or Rater's employer is:
 - A. The seller of this home or their agent
 - B. The mortgagee for some portion of the financed payments on this home
 - C. An employee, contractor or consultant of the electric and/or natural gas utility serving this home
- The Rater or Rater's employer is a supplier or installer of products, which may include:

HVAC systems.....	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Thermal insulation systems.....	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Air sealing of envelope or duct systems.....	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Windows or window shading systems.....	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Energy efficient appliances.....	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Construction (builder, developer, etc)	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer

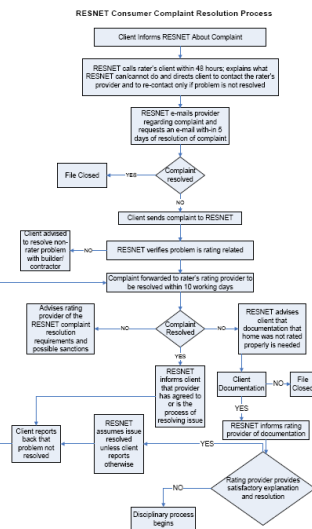
 Other (specify): _____ Rater Employer Rater Employer

This home may have been verified under the provisions of Chapter 6, Section 803 "Technical Requirements for Sampling" of the Mortgage Industry National Home Energy Rating Standard as set forth by the Residential Energy Services Network (RESNET).

Rater's Printed Name: _____ Certification #: _____
 Rater's Signature: _____ Date: _____

Complaint Resolution Process

Rater's must inform clients of the process.



HERS Raters

- New construction inspections
 - Energy Star
 - Green building programs
 - Energy Efficient Mortgages (EEM)
- Existing homes
 - Energy audits/home performance assessments
 - Utility programs
 - Weatherization
 - Energy Improvement Mortgages (EIM)

Green Raters

- RESNET developing a new classification of Rater to perform green building inspections.
- Additional two day
- RESNET Green Rater Certificate



BPI Certification

- Building Performance Institute (BPI) founded in 1993 by building tradespersons, project managers and public program professionals.
- Originally focused on certification for weatherization auditors and installation personal.
- Now certification for all residential and multifamily building performance contractors.

www.bpi.org



Rater Business Models

- Performance testing with conventional limited scopes
- Performance testing with broader work scopes and subcontracting
- Integrated whole-house approach with all services offered in-house
- Many offer new and existing home inspections
- 3 case studies

Performance Point



- Based in Charlotte, NC
- Key partnerships with HVAC, waterproofing and spray foam insulation contractors.
- Services
 - Air sealing
 - Energy Star and green building inspections
 - Manual J and D calculations
 - Consulting
 - Existing home inspections and improvements

<http://www.theperformancepoint.com/>

Environmental Services Group



ENVIRONMENTAL SOLUTIONS GROUP

- Based in Greensboro, NC
- Services
 - Energy Star and green building certifications
 - Energy audits for homes and businesses
 - IAQ assessments for mold, lead, asbestos, bacteria, moisture and industrial hygiene
 - Environmental health forensics
 - Construction management
 - No improvement/remediation work

www.esgtesting.com

Southern Energy Management



- Based in Raleigh, NC
- Service NC and parts of SC and VA
- Energy Star and green building certification
- Solar PV and hot water for residential, commercial and industrial

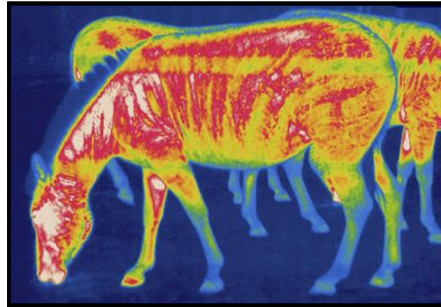
www.southernenergymanagement.com

Building Science Consultant

- How it should work
 - Train builders sales team
 - Train builders and supers
 - Train subcontractors
 - Consult during design phase
 - Review Manual-J load calculation
 - Predrywall inspection
 - Final inspection

Equipment

- At a minimum
 - Blower Door
 - Duct Blaster
 - Computer for HERS software
 - Tape measure
- Additional tools equipment
 - IR Camera
 - Moisture meter
 - Thermometer
 - Air flow meter
 - Digital camera



Zebras at the London Zoo shot with a FLIR camera

Blower Door

The Energy Conservatory



Minneapolis Blower Door

<http://www.energyconservatory.com/>

Retrotec



Q42 and Q46 Automated Blower Doors

<http://www.retrotec.com/>

Duct Leakage

Energy Conservatory



Minneapolis Duct Blaster

<http://www.energyconservatory.com/>

Retrotec

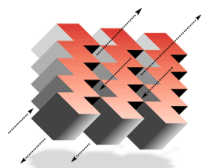


Q32 Duc-Tester

<http://www.retrotec.com/>

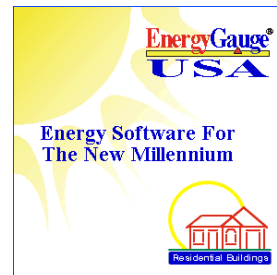
HERS Software

- What you use will be dictated by where you are and what your Rating Provider uses.



ARCHITECTURAL ENERGY
CORPORATION
Integrated Engineered Solutions

REM/Rate
www.archenergy.com



Energy Software For
The New Millennium

Energy Gauge
www.energygauge.com

Insurance

- RESNET and the IRS for Tax Credit Verifiers require \$500,000 in professional liability insurance.
- RESNET has arranged a package through Lockton Affinity.

Basic premium for individual Raters with at least one year of experience is approximately \$1,650* for Professional Liability coverage.

<http://www.locktonaffinity.com/resnet/>

*These examples represent basic pricing. Premiums can vary depending on the size of the rating enterprise and/or the nature of its operations.

Insurance, cont.

- Green building programs may require something too....

General Liability	\$1,000,000
Automobile Liability	\$500,000
Workers Compensation	As required by law
Employer's Liability	\$500,000
<small>This is typically part of Workers Compensation</small>	
Professional Liability	\$500,000
<ul style="list-style-type: none"> • Covers professionals for negligence and errors and omissions that injure clients. • Professionals are expected to have extensive technical knowledge or training in their particular area of expertise. They are also expected to perform the services for which they were hired, according to the standards of conduct in their profession. If they fail to use the degree of skill expected of them, they can be held responsible in a court of law for any harm they cause to another person or business. • Professionals that operate their own businesses need professional liability insurance in addition to an in-home business or business owner's policy. This protects them against financial losses from lawsuits filed against them by their clients. • When liability is limited to acts of negligence, professional liability insurance may be called "errors and omissions" liability. 	

NAHB Requirements for verifiers

Recap

We've covered...

- RESNET
- HERS Ratings & Standards
- HERS Training Providers
- HERS Rating Providers
- HERS Raters
- Green Raters
- BPI Certification



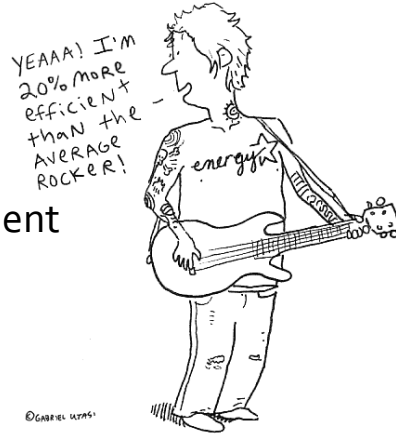
Energy Star

The national, US government-backed
symbol for
cost-effective
energy efficiency
while assuring same or better performance



Energy Star Background

- 1992 launched
- 50+ products categories
- 1+ Billion products sold
- \$14 Billion annual savings
- 25 Million vehicles equivalent GHG



©GABRIEL LUTASI

http://gabrielutasi.com/012007.energy_star.gif



A Growing Brand

- 70% awareness in 2004
- 5,000+ Active Builder Partners
- 750,000+ Labeled Homes



Energy Star is...



=

- *Truly Energy Efficient*
- *Credible*
- *Environmental Leadership*

*At least 15% more efficient than
2004 IECC code built homes*

Energy Efficiency

Green building starts with energy efficiency

- Saving energy prevents pollution
- Saving energy saves water (!)



Why certify

Which is energy efficient?



EarthCraft House and Energy Star certified
Atlanta, GA 2006



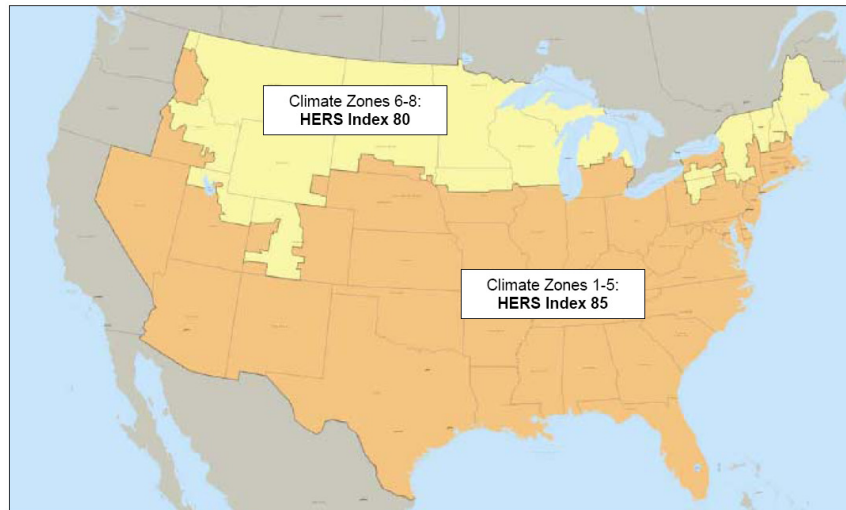
Standard home

Two Certification Paths

- Performance Path
 - HERS Index maximums
 - Thermal Bypass Checklist (TBC)
 - Max duct leakage
 - Minimum Energy Star certified products
 - Right sized HVAC
 - Lots of flexibility for specific upgrades

Performance Path

Maximum HERS Index Required to Earn the ENERGY STAR¹



Prescriptive Path

Builders Option Package (BOP)

- Checklist with no flexibility



Map is for illustrative purposes only and is based on figure N1101.2 from the 2004 International Residential Code (IRC).

National BOP

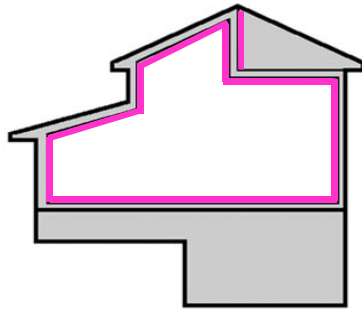


ENERGY STAR Qualified Homes National Builder Option Package

The requirements for the ENERGY STAR Builder Option Package (BOP) are specified in the table below. To qualify as ENERGY STAR using this BOP, a home must meet the requirements specified, be verified and field-tested in accordance with the HERS Standards by a RESNET-accredited Provider, and meet all applicable codes.

	Hot Climates ¹ (2004 IRC Climate Zones 1,2,3)	Mixed and Cold Climates ¹ (2004 IRC Climate Zones 4,5,6,7,8)
Cooling Equipment (Where Provided)	Right-Sized ² : <ul style="list-style-type: none"> ENERGY STAR qualified A/C (14 SEER / 11.5 EER); OR ENERGY STAR qualified heat pump³ (14 SEER / 11.5 EER / 8.2 HSPF) 	Right-Sized ² : <ul style="list-style-type: none"> 13 SEER A/C; OR ENERGY STAR qualified heat pump³ (14 SEER / 11.5 EER / 8.5 HSPF)
Heating Equipment	<ul style="list-style-type: none"> 80 AFUE gas furnace; OR ENERGY STAR qualified heat pump^{2,3} (14 SEER / 11.5 EER / 8.2 HSPF); OR 80 AFUE boiler; OR 80 AFUE oil furnace 	<ul style="list-style-type: none"> ENERGY STAR qualified gas furnace (80 AFUE); OR ENERGY STAR qualified heat pump^{2,3} (See Note 3 for specifications); OR ENERGY STAR qualified boiler (85 AFUE); OR ENERGY STAR qualified oil furnace (85 AFUE)
Thermostat ³	ENERGY STAR qualified thermostat (except for zones with radiant heat)	
Ductwork	Leakage ⁴ : ≤ 4 cfm to outdoors / 100 sq. ft.; AND R-6 min. insulation on ducts in unconditioned spaces ⁵	
Envelope	<ul style="list-style-type: none"> Infiltration^{5,7} (ACH50): 7 in CZ's 1-2 6 in CZ's 3-4 5 in CZ's 5-7 4 in CZ 8; AND Insulation levels that meet or exceed the 2004 IRC⁸; AND Completed Thermal Bypass Inspection Checklist⁹ 	
Windows	ENERGY STAR qualified windows or better (additional requirements for C22 and C24) ^{10,11,12}	
Water Heater ¹³	Gas (EF): 40 Gal = 0.61 60 Gal = 0.57 80 Gal = 0.53 Electric (EF): 40 Gal = 0.93 50 Gal = 0.92 80 Gal = 0.89 Oil or Gas ¹⁴ : Integrated with space heating boiler	
Lighting and Appliances ^{15,16}	Five or more ENERGY STAR qualified appliances, light fixtures, ceiling fans equipped with lighting fixtures, and/or ventilation fans	

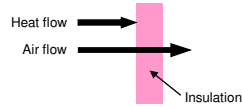
The Building Envelope



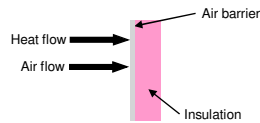
The Building Envelope consists of a thermal barrier and air barrier. They must be contiguous and continuous over the entire building envelope. The two must be perfectly aligned with the air barrier.



Building Science Basics



Most insulation does not stop the flow of air.



Air barrier prevents the flow of air through insulation.



Insulation settling away from sub-floor

Vertical Insulation

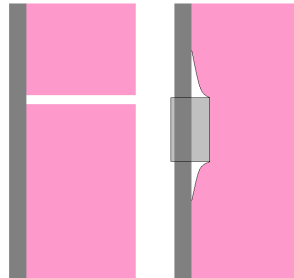
- All wall insulation must be enclosed on all 6 sides to allow proper performance.
- Problem areas: fireplace chases on exterior walls, tubs/showers on exterior walls, attic kneewalls and staircases on exterior walls.



Two installations of air barriers at tubs adjoining exterior walls

Insulation Grading

- Energy Star requires the insulation installation is graded.
- Goal: no gaps, voids or compression.



Gaps (left) and voids (right) allow air to flow through insulation.

Air Sealing Measures



BAD



GOOD

Duct Sealing

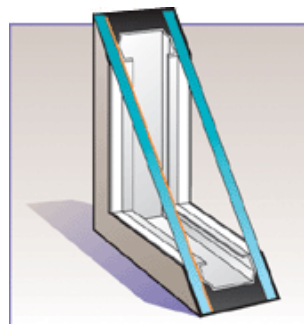
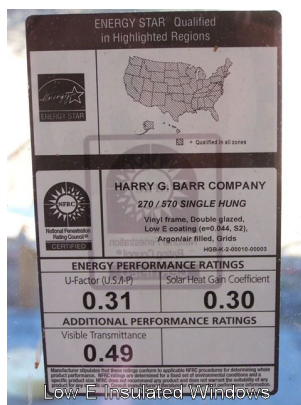


Recommended: Seal all duct connections with **mastic**



Seal the boot to subfloor/drywall connection with **caulk or mastic**

Energy Efficient Windows



Double pane low-e windows

Right-Sized HVAC

- Residential heating and cooling equipment is typically oversized
 - 143% - 322% for cooling
 - 106% - 234% for heating
- Most code officials don't check for Manual J and do not have proper training to

http://www.builtgreen.org/articles/0308_HVAC_sizing.htm

Bigger is not always better

- Higher equipment costs
- Poor dehumidification
- Short cycle
- Large temperature swings
- Lower efficiency and higher operating costs
- Shorter equipment life
- Comfort problems

Energy Star Process

The Energy Star Process

- Plan Review
- Right sized HVAC with Load Calculation
- Air Sealing Performed
- Pre-drywall Inspection
- Final Inspection with Performance Testing
- Certification

Certification Process

- Option #1: Individually verified
 - Every home receives TBC and final inspection with Blower Door and duct leakage test
- Option #2: Sampling
 - "Batch" a group of homes and test only a portion.
 - Only advised for large production builders who have proven quality control measures.

http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_sampling

Certification Includes

- Paper Certificate
- Sticker on the electrical box
- Optional Bronze Plaque

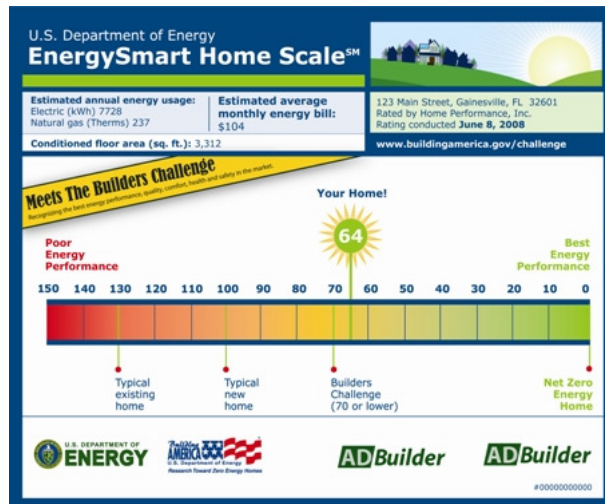


Other Programs

- EPA's Indoor Air Package/Plus
- EPA's Water Sense
- DOE's Builders Challenge
- Energy Star Advanced Lighting Package



DOE Builders Challenge



<http://www1.eere.energy.gov/buildings/challenge/index.html>

EPA's Indoor Air Package

Sections

1. Moisture Control
2. Radon Control
3. Pest Barriers
4. HVAC Systems
5. Combustion Systems & Garage Isolation
6. Building Materials
7. Home Commissioning



www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_iap

EPA's Water Sense



Energy Star certification for water fixtures and piloting new homes program.

www.epa.gov/watersense/

Advanced Lighting Package



- The Energy Star ALP designation only applies to new home construction.
- Must install a minimum of 60% ENERGY STAR qualified hard-wired fixtures and 100% ENERGY STAR qualified ceiling fans.

http://www.energystar.gov/index.cfm?c=fixtures.alp_consumers

Recap

We've covered...

- Energy Star
- DOE's Builders Challenge
- EPA's Indoor Air Package/Plus
- EPA's Water Sense
- Energy Star Advanced Lighting Package



Green Building Programs

- Approximately 50 different programs around the country.
- Two most popular national programs
 - NAHB Green Building Program
 - USGBC's LEED for Homes



Green Building is...

- Energy Efficient
- Resource Efficient
- Environmentally friendly
- Healthy
- Long lasting
- Quality
- Better
- A home painted green?



It doesn't have to be...



Can be New or Existing Homes



Seville Consulting's
2006 NAHB Green Remodeling Project of the
Year



LivingHomes' LEED Platinum Certified

Guiding Principles of Green Building

- Energy Efficiency
- Lot Design, Preparation and Development
- Resource Efficiency
- Water Efficiency
- Indoor Environmental Quality
- Operation, Maintenance and Homeowner Education
- Global Impact

Lot Preparation and Design

When Designing and siting the home

- Preserve trees
- Brown field vs. green field
- Orientate home north-south
- Native, drought tolerant species
- Proximity to Transit and amenities
- Appropriate home size



Tree Protection



Resource Efficiency

Material Selection

- Engineered wood products such as trusses and LVLs
- Rapidly renewable products such as bamboo
- Sustainably harvested and certified wood products



Efficient Lighting



Most efficient light is the sun!



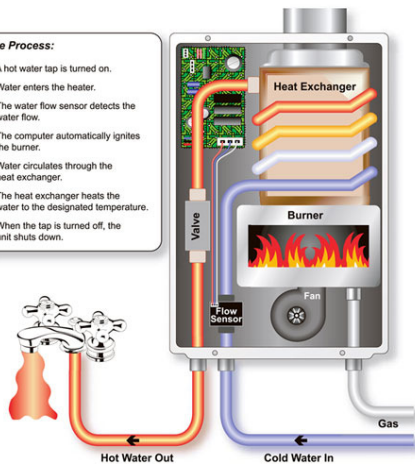
LED Lights



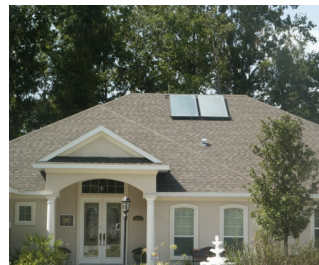
Pin-based CFL

Water Heating

- The Process:**
1. A hot water tap is turned on.
 2. Water enters the heater.
 3. The water flow sensor detects the water flow.
 4. The computer automatically ignites the burner.
 5. Water circulates through the heat exchanger.
 6. The heat exchanger heats the water to the designated temperature.
 7. When the tap is turned off, the unit shuts down.



Tankless water heater*



Solar Hot Water

*http://www.hotwaterguys.com/images/tankless_heater_final.jpg

Water Efficiency

Dual-flush toilets

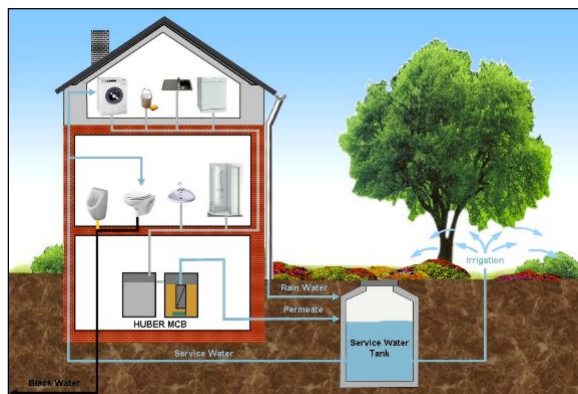
Figure 1 & 2 : Dual-Flush Toilet & Flush Selection



Low-flow shower heads



Water Efficiency



Greywater Collection

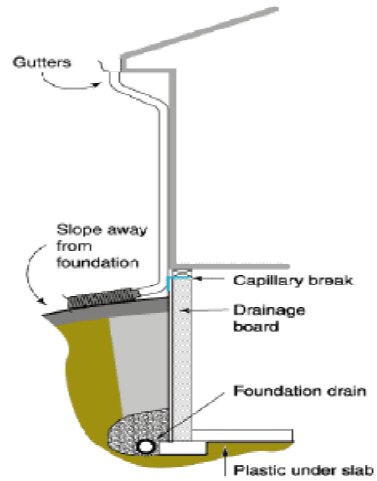


Rainwater Collection

Durability

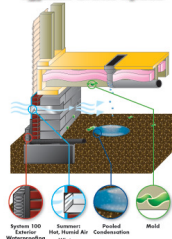
Keep moisture and bulk water out!

- Proper site drainage
- Foundation drainage board
- Foundation drain
- Sealed Crawls
- Exhaust fans
- Proper flashing details

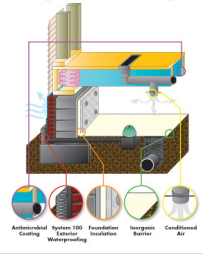


Conditioned Crawls

Typical Crawl Space



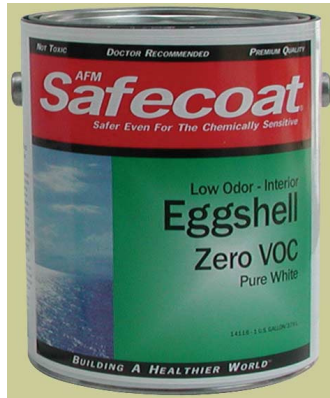
Encapsulated Crawl Space



Conditioned Crawls are

- More energy efficient than traditional crawlspaces
- Improves Indoor Air Quality
- Adds usable space to the home
- Prolongs the life of the structure
- Decreases recovery time after floods
- Floors are warmer in the winter
- Keeps pipes from freezing
- Optional sensors can give early warning to burst pipes and home performance Keeps hardwood floors looking good year round
- A Sealed Crawl simply makes your crawl space look presentable, which adds value to your home

Indoor Environmental Quality



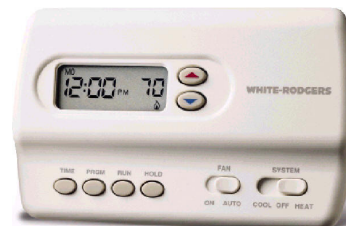
Use low or no VOC
paints and finishes



Built it tight and **VENTILATE** it right

Home Owner Guidance

- Ultimately the efficiency of the home is in the hands of the user/occupant!
- Thermostat set points and set back
- Exhaust fans
- Water use
- Water heater temp
- Changing HVAC Filters



Inspection Process

- Basically same as Energy Star
 - Predrywall Inspection (PDWI)
 - Visual inspection
 - Final Inspection
 - Blower Door and Duct Blaster Tests
 - Visual Inspection

NAHB Green



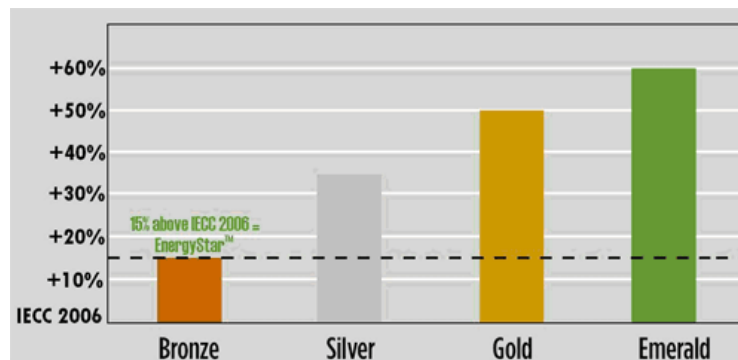
- ANSI approved ICC-700-2008 National Green Building Standard (NGBS)
- The Standard covers
 - single and multifamily homes
 - Residential remodeling
 - Site development
- ~100 homes certified to date

NAHB Green Standard

- The Guidelines reference
 - Lot Design
 - Resource Efficiency
 - Energy Efficiency
 - Indoor Environmental Quality
 - Homeowner Education
 - Global Impact.



Certification Levels



Rough breakdown of the energy efficiency differences between thresholds and illustrates the percentage above ENERGY STAR™

LEED for Homes

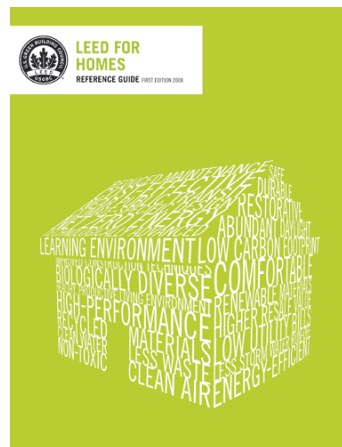
- Developed by the United States Green Building Council (USGBC)
- Pilot in 2004
- Program 2008
- 1328 homes certified to date



LEED for Homes

Sections

- Innovation and Design
- Locations and Linkages
- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality
- Awareness and Education



EarthCraft House

- Created in 1999 by the Greater Atlanta Home Builders Association in partnership with Southface Energy Institute.
- Originally just in Atlanta, now throughout the southeast (6 states).
- Over 5,200 ECH single family homes and over 2,000 EarthCraft Multifamily dwellings units certified.



EarthCraft House

- EarthCraft New Construction
- EarthCraft House- Multifamily
- EarthCraft- Communities
- EarthCraft- Renovations
- EarthCraft- Light Commercial



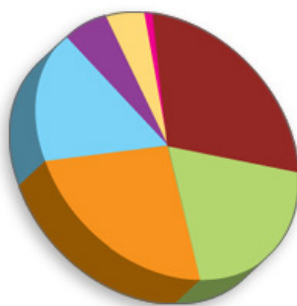
EarthCraft House

- Sections:
 - Site Planning
 - EE Building Envelope and Systems
 - Resource Efficient Design
 - Resource Efficient Building Materials
 - Waste Management
 - Indoor Air Quality
 - Water Conservation
 - Homebuyer Education
 - Builder Operations
 - Bonus Points



Why Green?

When surveyed by the National Association of Homebuilder's Research Center (NAHB-RC) in December of 2007, energy improvements topped homeowners choices for how they would spend an extra \$5,000 on their new homes.



26% would pay for energy improvements

22% for new countertop

23% for other

17% for upgraded flooring

6% for upgraded appliances

5% for upgraded bathroom features

1% for new siding

Economics of Green

	<i>Monthly</i>	<i>Annual</i>
<i>Utility Savings</i>	<i>\$45</i>	<i>\$540</i>
<i>Added Mortgage</i>	<i>\$20</i>	<i>\$240</i>
<i>Cost Savings</i>	<i>\$25</i>	<i>\$300</i>

Financial Incentives

- Local utility rebates
- Local county/city incentives
- Federal tax credit for energy efficient new homes
 - 50% more efficient than 2004 IECC for htg & clg
 - 10% of savings must come from envelope upgrades
 - Must have a HERS Rating
 - HERS Index varies
 - More stringent than ES

Benefits to Builder

- Less call backs
- More desirable product
- Marketing benefits
- Differentiation in the market

Benefits to Homeowner

- Lower operating costs
- Increased comfort
- Improved environmental quality
- Enhanced durability and less maintenance
- Increased home value



Recap

We've covered...

- Green building
- NAHB Green Standards
- LEED for Homes
- EarthCraft House
- Why green
- Financial incentives



Existing Homes

- Utility programs
- Home Performance with Energy Star
- REGREEN
- EarthCraft House- Renovations
- Building Performance Institute (BPI)
- Market that supports an inspection fee or has rebates key



Home Performance with Energy Star



- “National”, but only where local sponsor
- Test in and Test out
- Improvement priorities list
- Financing available
- Some markets have rebates

http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_hpwes

REGREEN

- Developed by the American Society of Interior Designers’ Foundation and USGBC
- “The nation's first green residential remodeling guidelines.”
- The guidelines are free to download and are full of best practices, case studies, and other resources.



REGREEN
ASID & USGBC
Residential Remodeling
Guidelines

REGREEN GUIDELINES 2008

http://www.greenhomeguide.org/guide_for_green_renovation/index.html

CO Poisoning

New & Existing construction



Sales & Marketing

- Customer relations and education sell jobs
- Networking- establish partners
- Website
- TV and radio is expensive
- Referrals
- Individual market drivers
- Challenge for existing homes- financing

Existing Homes Financing Options

- HVAC manufacturer or supply house loan programs
- Unsubsidized Fannie Mae loans through local utility or other facilitator
- Partner with local lenders
- Usually financing options just help homeowners to cope with “sticker shock.”
- Many use other options (credit cards, mortgage refinancing, etc.).

Why do Home Performance?

- Many contractors claim taking a home performance approach improves closing rates.
- Same closing rate, but high profit percentage per job and larger sales.
- Some markets contractors offer free inspections, but have higher gross profit margins
- Prequalify customers- make sure they are aware of likely improvement costs

Benefits to Homeowner

- Lower operating costs
- Increased comfort
- Improved environmental quality
- Enhanced durability and less maintenance
- Increased home value



Resources

Southface Energy Institute, Atlanta, GA
www.southface.org

Advanced Energy, Raleigh, NC
www.advancedenergy.org

Energy Star
www.energystar.gov

USGBC
www.usgbc.org

NAHB
www.nahbgreen.org

RESNET
www.resnet.us

Thank You

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