

Residential Green Building Programs



Carl Seville



Program Overview

- Goals
- History & Process
- Scoring Systems
- Individual Requirements
- Remodeling
- Certifying Buildings Vs. People

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Who



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What



- ... meet strict guidelines for energy efficiency set by the U.S. EPA. ...at least 15% more energy efficient ...typically.... 20–30% more efficient than standard homes
- Energy Efficiency Only

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What



- ...challenges...homebuilders to build 220,000 high performance homes...by 2012, ...spurring ... demand... homebuilders will ...differentiate their ...homes from other products...and make the benefits clear to buyers.

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What



- ...promotes...high-performance green homes. ...uses less energy, water...resources... healthier and more comfortable ... lower...bills; ...greenhouse gas emissions;... mold, mildew... The net cost ... comparable to ... a conventional home.

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What



- ... assures homeowners and the community that your projects meet the requirements of the... Guidelines, and truly are green.

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What



- ...program of the Greater Atlanta Home Builders Association in partnership with Southface. ...a blueprint for energy- and resource -efficient homes.

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Why

- Guidance
 - For Professionals
 - For Owners
- Quality Assurance
 - 3rd Party Verification
- Marketing
 - FMLS
- Sets Standards



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What Consumers Think:



- ...overwhelmed by the options ...and clueless about what's "required" to create a green-built home.
- ...82% thought Energy Star-rated appliances were...required..., followed...by water-saving features, high-performance windows, and solar panels.
- They think they have to have 10 out of 17 features.

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Energy Star



- Started: 1995
- Version 2: 2006
- Version 3: 2010 ANHC
 - Advanced New Home Construction
- Expanded Scope:
 - Indoor Air Plus
 - Advanced Lighting Package
 - Water Sense
 - Home Performance



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Energy Star

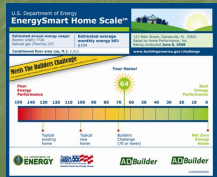


- Performance Path
 - Energy Model
 - HERS Index
- Prescriptive Path
 - Builder Option Package (BOP)
- Site Inspections
- Performance Testing
 - Blower Door
 - Duct Blaster



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DOE Builders Challenge



- Started: 2008
- HERS index
- Verifier Certifies
- Additional requirements:
 - HVAC Efficiency
 - Water Heater Efficiency
 - Duct leakage
 - Crawlspace sealing

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Scoring Systems



- Home Energy Rating System (HERS)
 - 0 to 100+ Scale
- Energy Star
 - 85 or Lower (South)
 - 80 or Lower (North)
- Builders Challenge
 - 70 or Lower
- Single Certification Level

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LEED for Homes



- Pilot: 2004
 - Based on existing local programs
- Program: 2008
- Procedure:
 - Excel Checklist
 - Detailed documentation
 - Extensive interpretation
 - Provider Reviews
 - USGBC Certifies
 - CIR and ID credits

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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

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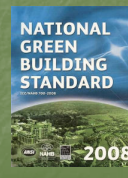
Scoring System



- Four Levels
 - Certified = 45 Points
 - Silver = 60 Points
 - Gold = 75
 - Platinum = 90
- Scoring Adjusted by Home Size
 - 1900 SF/3 Bedrooms = Neutral
 - Smaller: Reduce up to 10 Points
 - Larger: Increase (~Unlimited)

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NAHB



- Guidelines: 2005
- Program: 2008
- Standard: 2009
- Procedure:
 - Select Guidelines or Standard
 - On Line Checklist
 - Minimal Documentation
 - Verifier Reviews
 - NAHB Certifies

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NAHB



- Sections:
 - Lot Design, Preparation & Development
 - Resource Efficiency
 - Energy Efficiency
 - Water Efficiency
 - Indoor Environmental Quality
 - Operation, Maintenance, & Owner Education

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Scoring System



- Three Levels (Guidelines)
 - Bronze = 237 Points
 - Silver = 311 Points
 - Gold = 395 Points
- Minimum Points Per Category
- Bonus for Smaller Homes
 - Up to 10 Points
- Emerald Level
 - Available under Standard Only

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EarthCraft House



- Created: 1999
 - NAHB and EPA Pilot Project
- Expanded to 3 Tiers: 2007
- Regional
 - 6 Southeastern States

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EarthCraft House



- Procedure:
 - Excel Checklist
 - Moderate Documentation
 - Limited Interpretation
 - Technical Advisor Reviews
 - Technical Advisor Verifies
 - Quality Assurance by Southface

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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

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Scoring System



- Three Levels
 - Certified = 150 Points
 - Gold = 200 Points
 - Platinum = 230 Points
- Minimum Points Per Category
- Maximum Points in Efficiency
- Prerequisites for Gold & Platinum
- Bonus for Smaller Homes
 - Max 6 Points

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Program Requirements

- Prerequisites
 - By Program
 - By Scoring Section:
 - Energy
 - Combustion Safety
 - Insulation & Air Sealing
 - Ventilation
 - HVAC
 - Indoor Pollutants
 - Durability
 - Builder Operations

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Energy



- Blower Door Test
- Duct Blaster Test
- Minimum # of Energy Star Products Used
- Criteria:
 - HERS Index 85 (South)
 - HERS Index 80 (North) **OR**
 - Builder Option Package (BOP)

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Energy



- 30% better than IECC
- HERS Index 70 or lower
- Energy Star Windows

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Energy



- Energy Star **OR**
- Equivalent Through:
 - Insulation
 - Air Infiltration
 - Windows
 - HVAC
 - Appliances
 - Renewable Energy
- Extra Points for Over Energy Star
 - Based on HERS Index

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Energy



- Energy Star
 - Prescriptive Path (BOP)
 - Performance Path (HERS)
 - Blower Door
 - Duct Blaster
 - Duct Leakage
 - System Size
 - Energy Star Products
- Extra Points for Over Energy Star
 - Based on HERS Index

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Energy



- Better than 2003 IECC
 - Or Local Code if More Stringent
- ResCheck Software

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Insulation & Air Sealing



- No Pre-requisites



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Insulation & Air Sealing



- ~34 Pre-requisites
 - Air Sealing Building Envelope
 - Air Barrier on Insulation
 - Minimum R Values

Examples:

HVAC supply and return boots sealed to subfloor or drywall
 Window and door rough openings sealed
 Air barrier behind tubs and showers on insulated walls
 Attic kneewall doors R-3

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Insulation & Air Sealing



- Thermal Bypass Checklist
 - Pre Drywall Inspection
 - Must be Complete **BUT**
 - No Requirements



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HVAC



- Performance Path:
 - Maximum Duct Leakage
 - ≤ 6 cfm to outdoors / 100 sq. ft.
 - Manual J Load Calculation
 - Max 15% Oversizing

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HVAC



- Manual J Load Calculation
 - Max 15% Oversized AC
- Maximum Duct Leakage
 - $\leq 5\%$ of Floor Area to Outdoors
- No HVAC Equipment in Garage

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HVAC



- Manual J Load Calculation
- Manual D Duct Design
- Refrigerant Charge Verification
- Minimum MERV 8 Filters

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HVAC



- Manual J Load Calculation

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HVAC



- Manual J Load Calculation
 - Max 15% Oversized AC
- Equipment Matched via ARI
- R8 Duct Insulation
 - In Unconditioned Space
- Maximum Duct Leakage
 - ≤ 6% of Floor Area to Outdoors

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Durability



- No Pre-requisites



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Durability



- Moisture Management Details in Plans
 - Foundation Drains
 - Wall Drainage Plane
 - Field Verification

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Durability



- Durability Checklist
 - Custom for Each Project
 - Interior Measures:
 - Wet Area Walls
 - Wet Area Floors
 - Drain Pans
 - Dryer Exhaust

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Durability



- 7 Specific Measures
 - Wall to Roof Flashing
 - Porch to Wall Flashing
 - 2" Clearance From Siding to Roof
 - Kick Out Flashing at Roof Edge
 - Valleys Direct Water From Walls
 - Double Weather Barrier Behind Stucco
 - Weather Barrier at Wood Frame Walls

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Combustion Safety



- No Pre-requisites



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Combustion Safety



- No Unvented Appliances
- Space and Water Heating
 - Sealed Combustion OR
 - Outside House
- CO Detectors
- Doors on Fireplaces

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Combustion Safety



- No Unvented Appliances
- Space and Water Heating
 - Sealed Combustion OR
 - Outside Building Envelope
- No Air Handler in Garage
- No Ducts to Garage

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Ventilation



- No Pre-requisites



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Ventilation



- Whole House Ventilation
 - Comply with ASHRAE 62.2
 - Exceptions for:
 - Mild Climate
 - Engineered Passive System
- Fans Ducted to Exterior
 - Comply with ASHRAE 62.2
 - Use Energy Star Fans

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Ventilation



- Whole House Ventilation
 - Comply with ASHRAE 62.2
 - Intakes Away from Car Exhaust
- Fans Ducted to Exterior

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Indoor Pollutants



- No Pre-requisites



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Indoor Pollutants



- Radon Resistant Construction
- No HVAC Equipment in Garage

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Indoor Pollutants



- Protect Ducts
- Non CCA Treated Lumber

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Builder Operations



- No Pre-requisites



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Builder Operations



- Certified Tropical Wood Letter
 - To Suppliers
- Accountability Checklist
 - Signed by Responsible Parties
- Homeowner Training
 - Manual
 - 1 Hour Walk Through

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Builder Operations



- Build 1 EarthCraft House/Year
- 5 per Year if Building <50

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Costs

- Fees to Rater or Verifier
- Fees to Organizations
- Additional Expenses



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Costs - ~ 2500 SF



- Independent Raters Set Rates
 - ~ \$500



- Independent Verifiers Set Rates
 - TBD



- Southface or Independent Verifiers
 - ~\$625

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Costs - ~ 2500 SF



- Independent Providers Set Rates
 - ~\$3000-\$4000
- USGBC Fees
 - \$375 Member
 - \$525 Non Member



- Independent Verifiers Set Rates
 - ~\$400
- NAHB Fees
 - \$200 Member
 - \$500 Non Member

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Additional Costs

- Travel Time
- Load and Duct Calculations
- Flow Testing
- Consulting
- Training
 - EarthCraft House
- Required Workshops
 - LEED for Homes

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Total Certified to Date



- 1328
 - 5200 Single Family
 - 2031 Multi Family



- 940,000



- 100

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Remodeling



- Not Available
- Home Performance Program
 - Recommended Upgrades
 - Not a Certification
 - Rebates and Financing Available

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Remodeling



- Gut Remodel Projects Only
 - All Walls Stripped
 - From Interior or Exterior



- ReGreen Guidelines
 - ASID/USGBC Project
 - Not a Certification

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Remodeling



- Renovation Certification
 - Based on New Homes Program
 - Includes Before and After Testing
 - Checklist
 - Requirements

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Remodeling



- Available under Standard
 - On-Line Tool In Development
 - Currently Scored Manually
 - Not Available for Guidelines



- Not Available for Remodeling

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Individual Designations



- LEED AP+Homes
 - Test
 - Accreditation Pilot March 2009

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Individual Designations



- NAHB
 - Certified Green Professional (CGP)
 - 24 Hours Classroom Training
 - Test
 - 2 Years Construction Experience

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Individual Designations



- NARI
 - Green Certified Professional (GCP)
 - 5 Years Green Experience
 - Test
 - 24 Hour On Line Training (Optional)

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My Opinion



- Strong National Brand
- Single Level
- Energy Only
- Acceptance of New Sections TBD
- ANHC = Full Green Program

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My Opinion



- Single Level
- Bridge Between Energy Star and Green Building Programs
- Market Penetration TBD
- Confusion with Energy Star

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My Opinion



- Still New
- Guidelines vs. Standard?
- Basic Entry Level
 - No Performance Testing
- Higher Levels Demanding
- Fewest Prerequisites
- Web Based Checklist
 - Built in Error Check
 - Runs Slowly
- Verifier Training Modest

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My Opinion



- Highest Entry Level
- Strong Market Presence
- Costly Certification Process
- Extensive Prerequisites
- Complex Checklist
 - No Error Checking
- Reference Guide
 - Dense
- Provider Training Extensive

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My Opinion



- Moderate Entry Level
- Higher Levels Demanding
- Strong Local Market Presence
- Extensive Prerequisites
- Big Checklist
 - No Error Checking
- Certifier Training Extensive

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Totally Confused Yet?

- What to Look For
 - Marketing Value
 - Third Party Certification
 - Energy Star as a Minimum
 - Benefits You & Your Clients Desire
 - Aim as High as Possible
 - Continuous Improvement
 - Don't Drink From the Firehose
 - Stay Nimble – Things Keep Changing

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Thank You



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