Habitat HERS Raters
A Call To Action

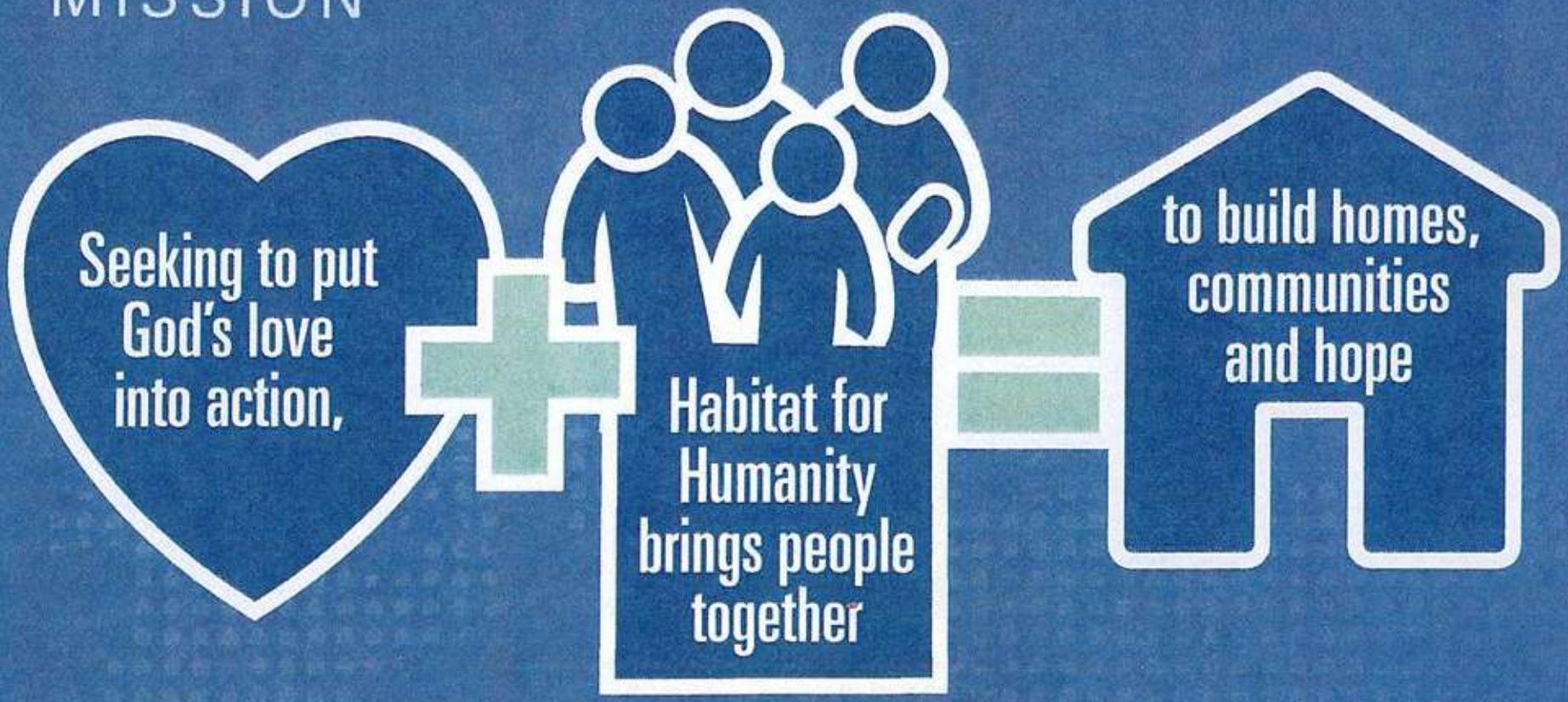
Rob Howard
Habitat for Humanity International
Sustainable Building Specialist


LOWE'S


PROVIDING A
HAND UP NOT
A HAND OUT.


Habitat
for Humanity
Habitat
for Humanity
Habitat
for Humanity

MISSION



VISION

A world where everyone has a decent place to live.

Habitat for Humanity® Homeownership

TOP 10 **HOMEBUILDER** in the United States

1,500 **U.S. AFFILIATES** in all 50 states & D.C.

Habitat builds in partnership with people in need of

simple, decent, affordable housing.

Habitat Homebuyers

QUALIFICATIONS

Applicants for a Habitat home must qualify based on need.

SWEAT EQUITY

Homebuyers devote "sweat equity" hours to help build their home and others in the Habitat program.

MORTGAGE

Homebuyers pay an affordable, no-profit mortgage, which is used to build more Habitat homes.

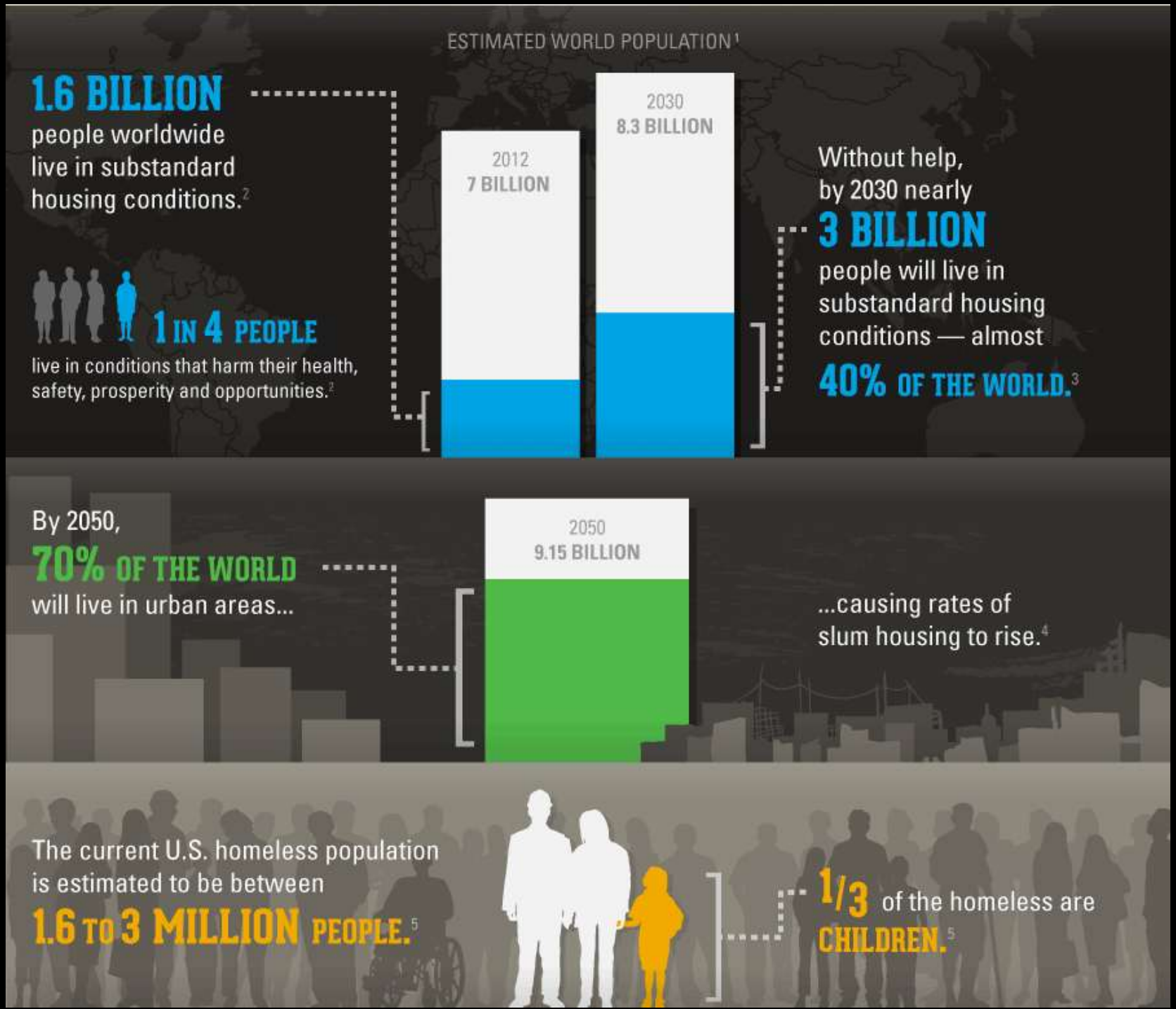
Habitat also...

- Repairs low-income housing
- Advocates for fair and just housing policies
- Provides training and access to resources to help families improve their housing conditions
- Participates in holistic neighborhood revitalization efforts
- Helps neighborhoods clean up and rebuild after disasters
- Accepts donations of reusable and new household materials for resale through its ReStores

Neighborhood Revitalization Initiative

Transforming neighborhoods by providing house repairs for low-income homeowners and rehabilitating vacant and foreclosed properties.

LEARN MORE >


ESTIMATED WORLD POPULATION[1]
1.6 BILLION
people worldwide
live in substandard
housing conditions.[2]
1 IN 4 PEOPLE
live in conditions that harm their health,
safety, prosperity and opportunities.[2]
2012
7 BILLION
2030
8.3 BILLION
Without help,
by 2030 nearly
3 BILLION
people will live in
substandard housing
conditions — almost
40% OF THE WORLD.[3]
By 2050,
70% OF THE WORLD
will live in urban areas...
2050
9.15 BILLION
...causing rates of
slum housing to rise.[4]
The current U.S. homeless population
is estimated to be between
1.6 TO 3 MILLION PEOPLE.[5]
1/3 of the homeless are
CHILDREN.[5]

EVERY **5 1/2 MINUTES** HABITAT FOR HUMANITY SERVES A FAMILY IN NEED OF DECENT HOUSING

WE ENGAGE APPROXIMATELY
1 MILLION VOLUNTEERS ANNUALLY

PEOPLE SERVED
THROUGH BETTER HOUSING SOLUTIONS:
3 MILLION
SINCE 1976

IN 2012,
HABITAT SURPASSED
ITS MILESTONE OF
600,000 HOMES
AND KEPT BUILDING

RECORD-BREAKING
94,618
FAMILIES SERVED
IN FISCAL YEAR 2012

WE WILL WORK UNTIL
PEOPLE IN NEED OF SAFE AFFORDABLE HOUSING = 0

HABITAT'S VISION: A WORLD WHERE EVERYONE HAS A DECENT PLACE TO LIVE.

HABITAT.ORG

America's Top Builders by the numbers

2012 Rank	2011 Rank	Company	Total Closings	Total Revenue (in millions)
1	1	D.R. Horton (p)	19,954	$4,722
2	2	PulteGroup (p)	16,505	$4,820
3	3	Lennar Corp. (p)	13,802	$4,105
4	4	NVR (p)	9,843	$3,193
5	5	KB Home (p)	6,282	$1,560
6	7	Hovnanian Enterprises (p)	5,356	$1,806
7	8	The Ryland Group (p)	4,809	$1,308
8	9	Beazer Homes USA (p)	4,428	$1,006
9	10	Meritage Homes Corp. (p)	4,238	$1,194
10	6	Habitat for Humanity International	3,766	$1,500


energy
ENERGY STAR


VOLUNTEER ENERGY RATER
Habitat for Humanity®
Building AMERICA
U.S. Department of Energy
RESNET

RESNET Volunteer Raters

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

BUILDING TECHNOLOGIES PROGRAM

RESNET Raters Volunteer

with Habitat for Humanity

Orlando, Florida

Volunteer raters assisted Orlando Habitat for Humanity with energy ratings in Stag Horn Villas, a 58-townhome development in Orlando, Florida.

HOT-HUMID CLIMATE

BUILDER PROFILE

Affiliate:
Orlando Habitat for Humanity, Orlando, FL

Founded:
1986

Homes Built in Florida:
166 homes

(15 built in 2009)

Homes Built Internationally:
90+ homes

Building America
U.S. Department of Energy
Research Toward Zero Energy Homes

Overview

Since 1995, The U.S. Department of Energy's Building America program has provided technical assistance to Habitat for Humanity International and local Habitat affiliates interested in building cost effective, energy efficient homes. RESNET supports Building America efforts by encouraging their members to provide free home energy ratings to their local Habitat affiliates. Partnerships between RESNET and Habitat for Humanity increase awareness of the home energy rating process and help affiliates identify areas of improvement and set goals such as ENERGY STAR® or the Department of Energy's Builders Challenge by conducting preliminary ENERGY STAR® ratings.

RESNET Volunteers

RESNET member Rod Kosares of Professional Testing Associates, Inc. has committed to providing free Home Energy Rating System evaluations (HERS ratings) to Orlando Habitat for Humanity since 2009. When Orlando Habitat approached him about energy ratings for their new Stag Horn Villas community, Kosares says he was intrigued by the project. Not only was it an opportunity to participate in the affiliate's first multi-family community, but it was also a chance to assist the affiliate in creating a potential model for future Habitat developments in urban areas, he explains.

Orlando Habitat's high levels of energy-efficiency and careful research helped them achieve standards that exceeded ENERGY STAR® qualifications. Kosares explains that the affiliate required very little input from him on their initial homes. "As far as specifications, it was more about best practices," states Kosares, regarding his recommendations to Orlando HFH. Kosares provided on-site training to the affiliate for their first building in Stag Horn Villas, and as ENERGY STAR® standards change, Kosares continues to assist the affiliate in adapting modifications to their building process.

Florida Green Building Coalition rater, David Cobb, also participated in the home energy assessment of Stag Horn Villas by providing free green ratings to the affiliate. Once again, Orlando Habitat received praise for their efforts. Through their high-standard approach to energy efficiency, the affiliate was able to meet FGBC's Gold standard. Cobb says the Stag Horn project is exceptional because the level of efficiency was achieved in an extremely affordable way. "It's really partly the design of the building, partly the energy efficiency components and ability to qualify for the HERS rating and then the other practices that they were doing related to sustainability that enable them to perform at that level," states the FGBC rater. According to Cobb, the sustainability and "green" sectors play an important role in FGBC rating for affordable housing. "The design of the home had already anticipated being energy efficient, so they [Orlando HFH] put in good insulation, double pane low-e glass windows, high SEER air conditioning. Things like that kept the energy use down," explains Cobb.

RESNET is a membership organization that produces national standards for building energy efficiency rating systems.

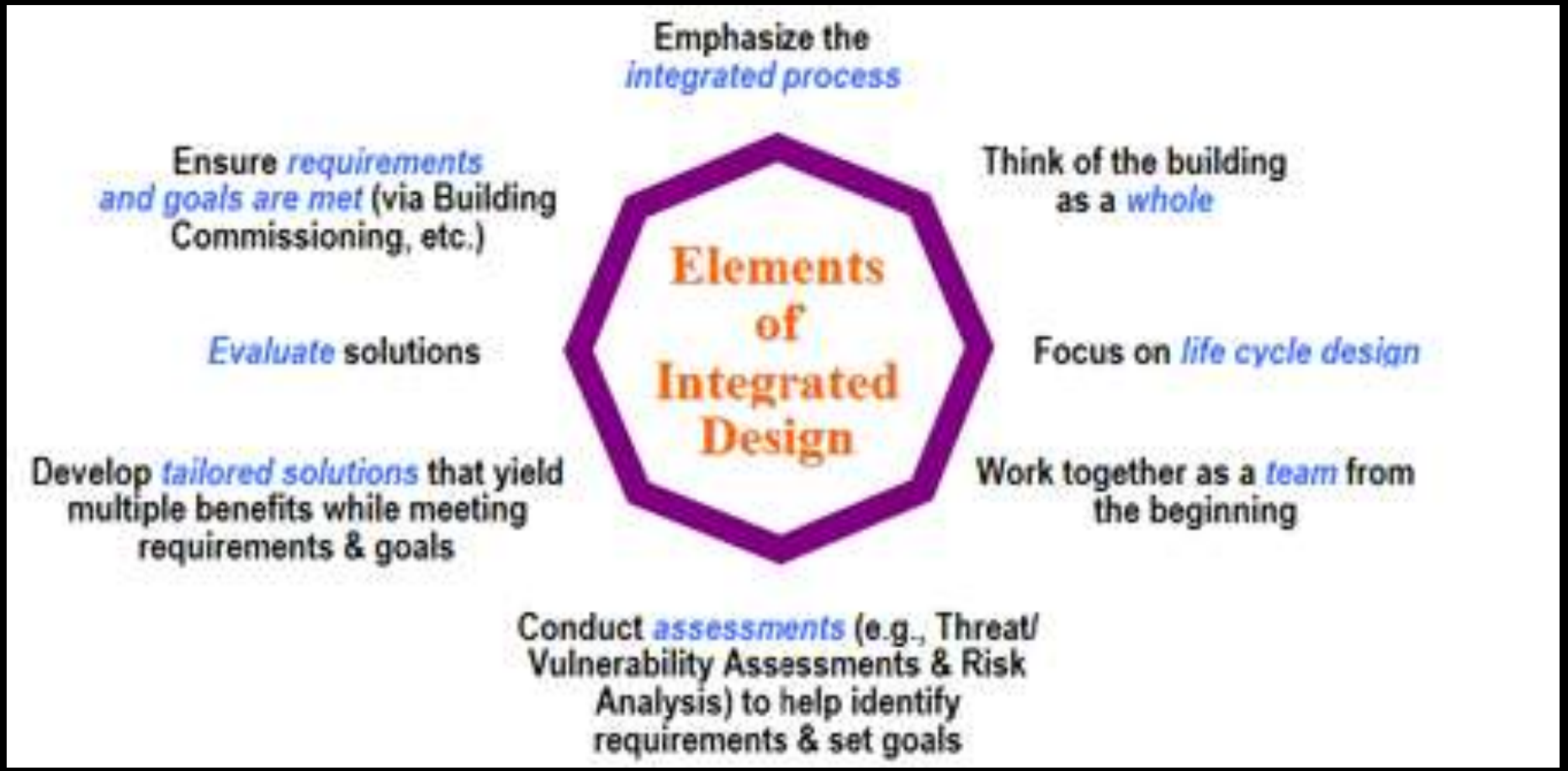

ENERGY STAR
AWARD 2013
PARTNER OF THE YEAR
Sustained Excellence


RESNET®
HERS
INDEX


earthcents®

HUD.GOV/HUDHomes

U.S. Department of Housing and Urban Development


Emphasize the integrated process
Ensure requirements and goals are met (via Building Commissioning, etc.)
Think of the building as a whole
Elements of Integrated Design
Evaluate solutions
Focus on life cycle design
Develop tailored solutions that yield multiple benefits while meeting requirements & goals
Work together as a team from the beginning
Conduct assessments (e.g., Threat/ Vulnerability Assessments & Risk Analysis) to help identify requirements & set goals

WE WANT YOU!


SHOW ME THE MONEY!


A Modest Proposal

Become a Volunteer Today!

Learn new skills, meet new friends, have fun and help your community!

LEARN MORE >


From Hope
To Home

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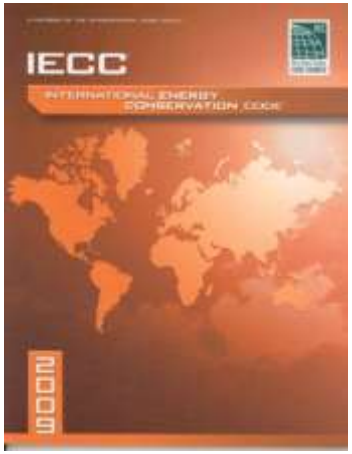
Scott Lee
Southface Energy Institute
EarthCraft Affordable Housing Initiative

History of Energy Codes

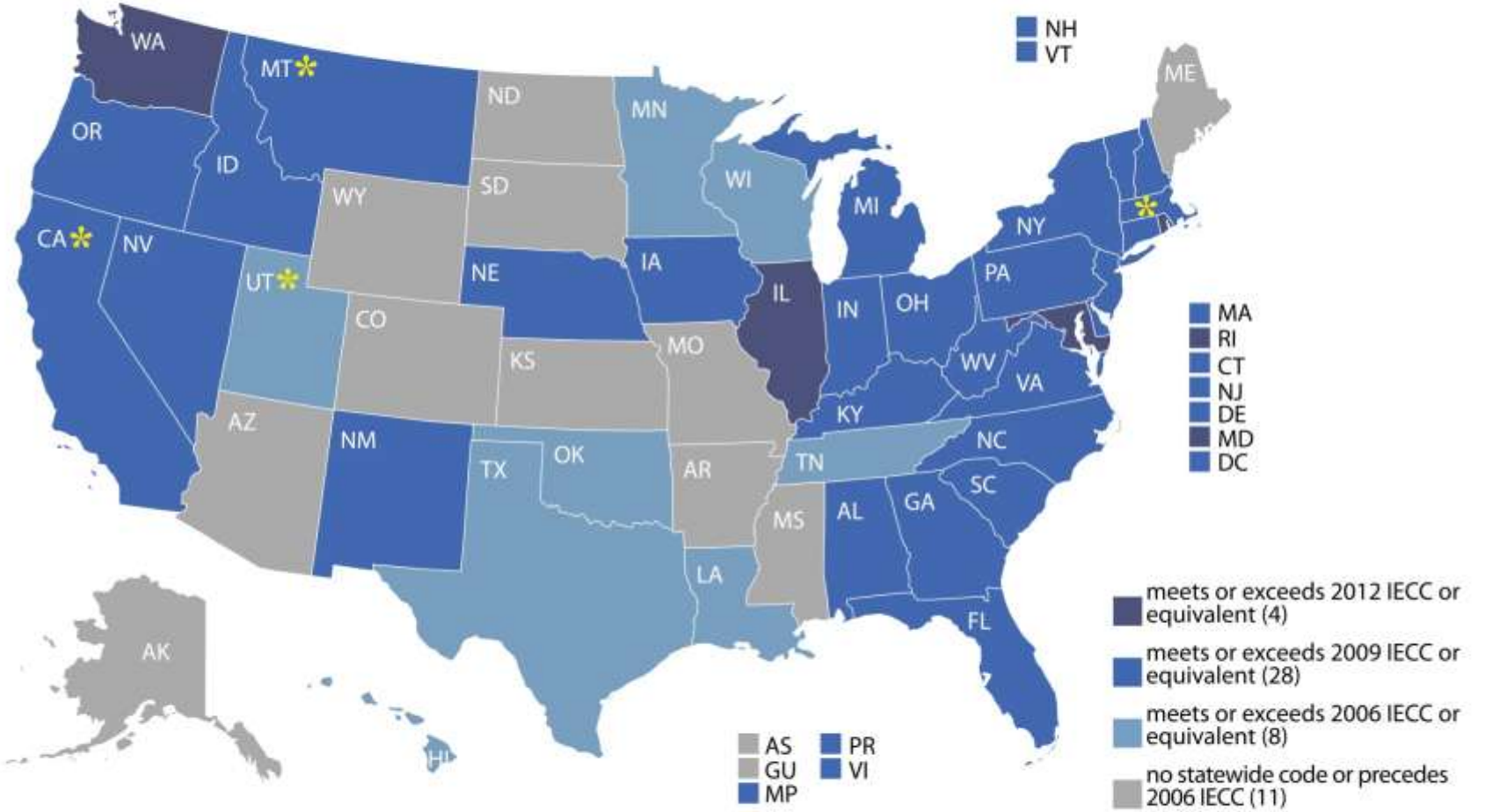
- MEC 1992, '93, 95 – "Early" energy codes, complicated, DP windows required
- IECC 98, 2000, '03 – "Strengthening", SHGC of 0.4 required where < 3500 HDD
- IECC 2004, '06 – "Simplification", Fewer CZ's, eliminate % glazing, certificate required
- IECC 2009 – "Latest", duct + envelope testing, efficient lighting required



- The code keeps pushing the bar!
  ('09 Code is ~15% more stringent than '06 version)

Residential State Energy Code Status

AS OF FEBRUARY 1, 2014

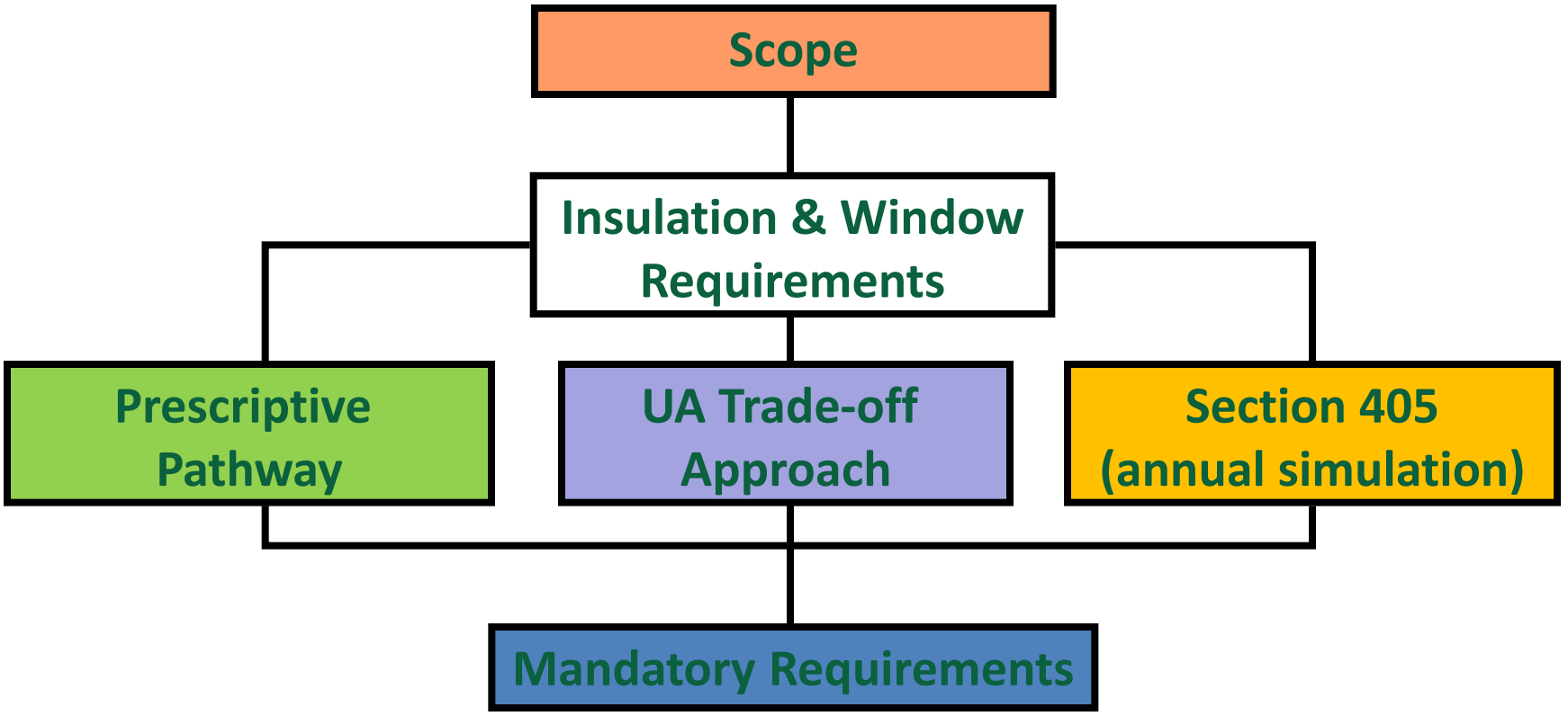


BCAP Dedicated to the adoption, implementation, and advancement of building energy codes

Get all the most up-to-date code status maps and other valuable resources at www.energycodesocean.org

NOTE: These maps reflect only mandatory statewide codes currently in effect.

Energy Code Compliance Pathways



2009 IECC- Section 401.3

Mandatory Requirement:

Certificate on panel box or air handler shows

- Major Component R-values (envelope summary)
- Glazing U-factor, SHGC
- Equipment Efficiencies (mechanical summary)
- **GA Specific**: *Load Calculations*
- **GA Specific**: *Envelope Testing Results*
  Duct Testing Results

402.4.2 Air Barrier and Insulation Inspection

NUMBER	COMPONENT	CRITERIA
1	Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.
2	Ceiling/attic	Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed.
3	Walls	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
4	Windows and doors	Space between window/door jambs and framing is sealed.
5	Rim joists	Rim joists are insulated and include an air barrier.
6	Floors (including above-garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of insulation.
7	Crawl space walls	Insulation is permanently attached to walls. Exposed earth in unvented crawl spaces is covered with Class I vapor retarder with overlapping joints taped.
8	Shafts, penetrations	Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.
9	Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.
10	Garage separation	Air sealing is provided between the garage and conditioned spaces.
11	Recessed lighting	Recessed light fixtures are air tight, IC rated, and sealed to drywall. Exception—fixtures in conditioned space.
12	Plumbing and wiring	Insulation is placed between outside and pipes.

Diagnostic/Verification Tools

Blower Door

Duct Blaster

Duct and Envelope Tightness (DET) Verifier

Certified DET Verifier can either:

- Be previously certified
  - HERS Rater
  - BPI Analyst
  - Home Performance with ENERGY STAR contractor
- Pass a DET Verifier Course
  - Explain calculations for ACH50 and % duct leakage
  - Discuss testing protocol (setup, safety, and accuracy)
  - Field exam on tools (use blower door and duct tester)
  - Pass Written Exam – 25 Questions (1 hour)

CERTIFIED DUCT AND ENVELOPE TIGHTNESS (DET) VERIFIER. A certified DET verifier shall be a certified Home Energy Rating Systems (HERS) rater, or be a certified Home Performance with ENERGY STAR contractor, or be a Building Performance Institute (BPI) Analyst, or successfully complete a certified DET verifier course that is approved by the Georgia Department of Community Affairs.
(Effective January 1, 2011)

Compliance Certificate

Equipment Sizing & Duct Testing Results

Mechanical Summary:

Water Heater Energy Factor: 0.61 Ef Fuel type: [X] Gas [ ] Electric [ ] Other

Number of Heating and Cooling Systems: _____

Heating System Type (choose one):

[X] Gas: 92.4 AFUE [ ] Air-Source Heat Pump: _____ HSPF

[ ] Other: _____ Efficiency: _____

Cooling System Type (Standard DX, Heat Pump, Geothermal, etc.): Standard DX

Cooling System Efficiency: 13 [X] SEER [ ] EER [ ] Other

Heating/Cooling Load Calculations Performed by: Jay Manuello Phone: 404-555-1111

Total Heating Load (Based on ACCA Man. J or other approved methodology): 38,944 Btu/h

Total Cooling Load (Based on ACCA Man. J or other approved methodology): 28,022 Btu/h

Cooling Sensible Load: 20,011 Btu/h Cooling Latent Load : 8,011 Btu/h

Total Air Handler CFM (based on design calculations): 992 CFM

Duct Tightness Test Conducted by: Dee E. Teverifer Phone: 404-555-2222

CFM_{25} per 100 ft^2 of conditioned floor area = CFM_{25} x 100 / Conditioned floor area served

If all ducts are not located within conditioned space, builder must verify that either the postconstruction duct leakage to outdoors (**PCO**) is ≤ 8 cfm/100 ft^2, the post construction total duct leakage (**PCT**) is ≤ 12 cfm/100 ft^2, or the rough-in test (**RIT**) with air handler installed is ≤ 6 cfm/100 ft^2. State which method was used to conduct the duct tightness test: duct blower (**DB**), modified blower door subtraction method (**MBDS**), or automated multipoint blower door (**AMBD**).

System	Method (DB, MBDS, AMBD)	Test (PCO, PCT, RIT)	CFM_{25}	Area served (ft^2)	Test Result
1 Main	DB	PCO	82	1,600	5.1%
2					
3					

*Note: This permanent certificate shall be posted on or in the electrical distribution panel. Certificate shall be completed by the builder or registered design professional. Where there is more than one value for each component, certificate shall list the value covering the largest area.

Go to southface.org to download fillable pdf of this form!

Blower Door Results go here:

Load Calc Results go here:

Duct testing Results go here:

Georgia Residential Energy Code Compliance Certificate*

Builder/Design Professional: ABC Builder Phone: 404-123-4567

Envelope Summary:

- List the R-Value for the following components:

Flat ceiling/roof:	R-30	Sloped/vault ceiling:	n/a
Exterior wall:	R-13	Above grade mass wall:	n/a
Attic kneewall:	n/a	Attic kneewall sheathing:	R18
Basement stud wall:	n/a	Basement continuous:	n/a
Crawlspace stud wall:	n/a	Crawlspace continuous:	n/a
Foundation slab:	R-0	Floors over unconditioned space:	R19
Cantilevered Floor:	n/a	Other insulation:	n/a

- Fenestration Components:

Window U-factor:	0.32	Window SHGC:	0.29
Skylight U-factor:	n/a	Skylight SHGC:	n/a
Glazed Door U-factor:	n/a	Opaque Door U-factor: (<50% glazed)	0.35

- Building Envelope Tightness (BET):

BET test conducted by: Home Performance Smith Phone: 404-123-6547

Fan Flow at 50 Pascals= 2,000 CFM_{50} Total Conditioned Volume = 20,000 ft^3

ACH_{50} = CFM_{50} x 60 / Volume= 6 ACH_{50} (must be less than 7 ACH_{50})

Low Rise Multifamily Visual Inspection Option

(The visual inspection option may be conducted by a third-party instead of the BET test for R-2 buildings only.)

Visual inspection conducted by: n/a Phone: n/a

Mechanical Summary:

Water Heater Energy Factor: 0.61 Ef Fuel type: ☑ Gas ☐ Electric ☐ Other

Number of Heating and Cooling Systems: 1

Heating System Type (choose one):

☑ Gas: 90% AFUE ☐ Air-Source Heat Pump: _____ HSPF

☐ Other: _____ Efficiency: _____

Cooling System Type (Standard DX, Heat Pump, Geothermal, etc.): Standard DX

Cooling System Efficiency: 13 ☑ SEER ☐ EER ☐ Other

Heating/Cooling Load Calculations Performed by: HVAC Smith Phone: 770-123-4567

Total Heating Load (Based on ACCA Man. J or other approved methodology): 39,800 Btu/h

Total Cooling Load (Based on ACCA Man. J or other approved methodology): 28,800 Btu/h

Cooling Sensible Load: 20,800 Btu/h Cooling Latent Load : 8,000 Btu/h

Total Air Handler CFM (based on design calculations): 1600 CFM

Duct Tightness Test Conducted by: HVAC Smith Phone: 404-123-4567

CFM_{25} per 100 ft^2 of conditioned floor area = CFM_{25} x 100 / Conditioned floor area served

If all ducts are not located within conditioned space, builder must verify that either the postconstruction duct leakage to outdoors (**PCO**) is ≤ 8 cfm/100 ft^2, the post construction total duct leakage (**PCT**) is ≤ 12 cfm/100 ft^2, or the rough-in test (**RIT**) with air handler installed is ≤ 6 cfm/100 ft^2. State which method was used to conduct the duct tightness test: duct blower (**DB**), modified blower door subtraction method (**MBDS**), or automated multipoint blower door (**AMBD**).

System	Method (DB, MBDS, AMBD)	Test (PCO, PCT, RIT)	CFM_{25}	Area served (ft^2)	Test Result
1	DB	PCT	100	2,000	5
2					
3					

*Note: This permanent certificate shall be posted on or in the electrical distribution panel. Certificate shall be completed by the builder or registered design professional. Where there is more than one value for each component, certificate shall list the value covering the largest area.

Energy Code and Performance Testing for Sweet Tea and Grits States

State	Code Cycle	Blower Door Testing Required	Duct Pressure Testing Required	DET Program
Alabama	2009 IECC	No	Yes	Yes
Georgia	2009 IECC	Yes	Yes	Yes
Mississippi	No Residential Code	No	No	No
South Carolina	2009 IECC	No	Yes	Yes
North Carolina	2009 IECC	No	Yes	No
Tennessee	2006 IECC	No	No	No
Louisiana	2006 IECC	No	No	No
Virginia	2009 IECC (adopting 2012 IECC in 06/2014)	No	No	No

Resources

Pacific Northwest Laboratory: 1-800-270-CODE

www.energycodes.gov www.bcap-energy.org

www.dca.state.ga.us www.bcap-ocean.org

www.southface.org www.dsireusa.org

www.sustainablecitiesinstitute.org

www.iccsafe.org www.ashrae.org