

HERS Meets Green Building

February 18, 2007





Overview

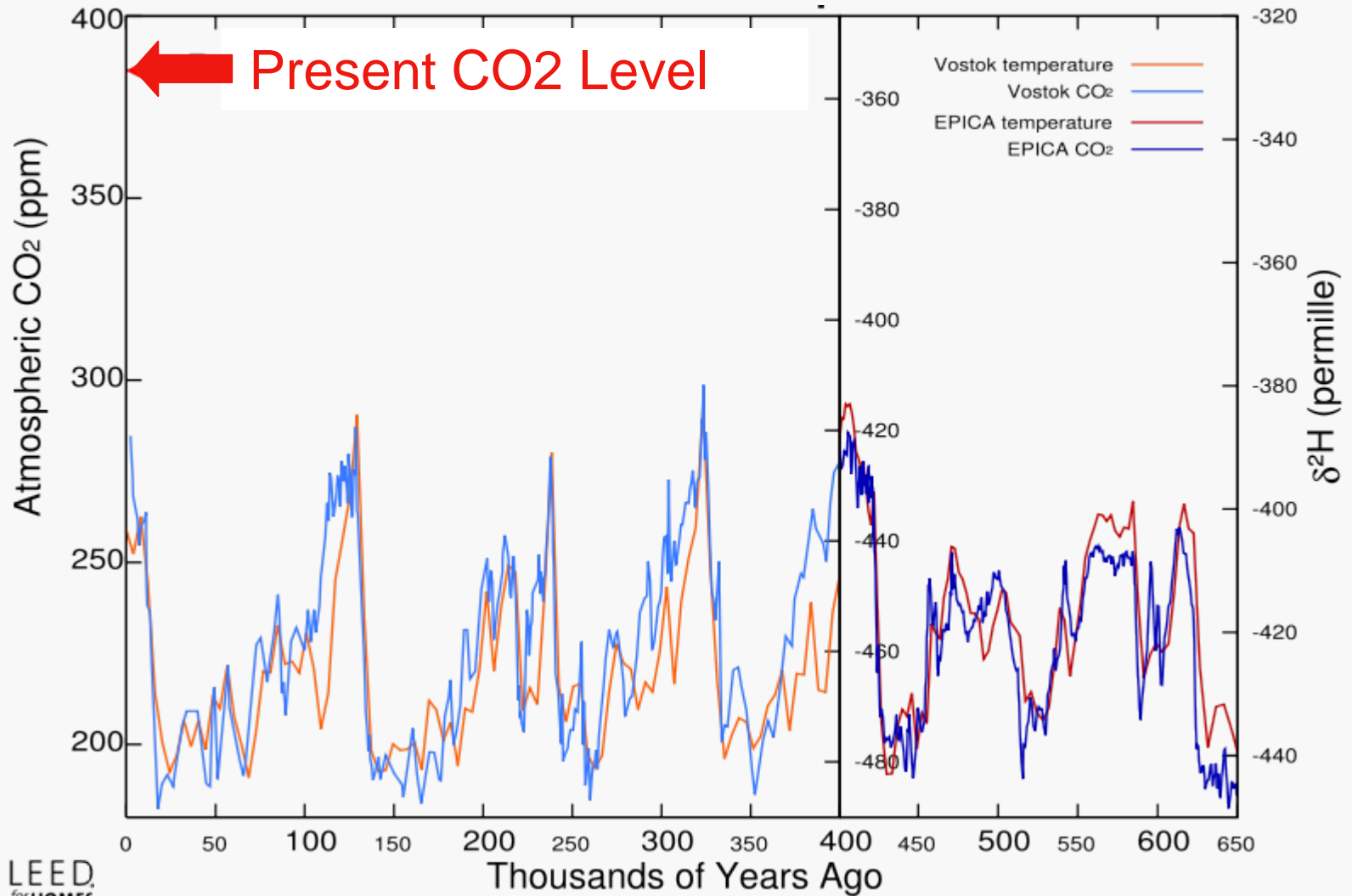
- 1. Growing Consumer Demand**
- 2. Emerging Business Opportunity**
- 3. Strategy for Collaboration w/ Other Programs**
- 4. Overview of Certification Model**

An aerial photograph of a suburban residential neighborhood. The houses are arranged in a grid-like pattern with winding streets. Many houses have swimming pools in their backyards. The roofs are mostly light-colored, and the overall scene depicts a well-developed, affluent residential area.

Growing Consumer Demand

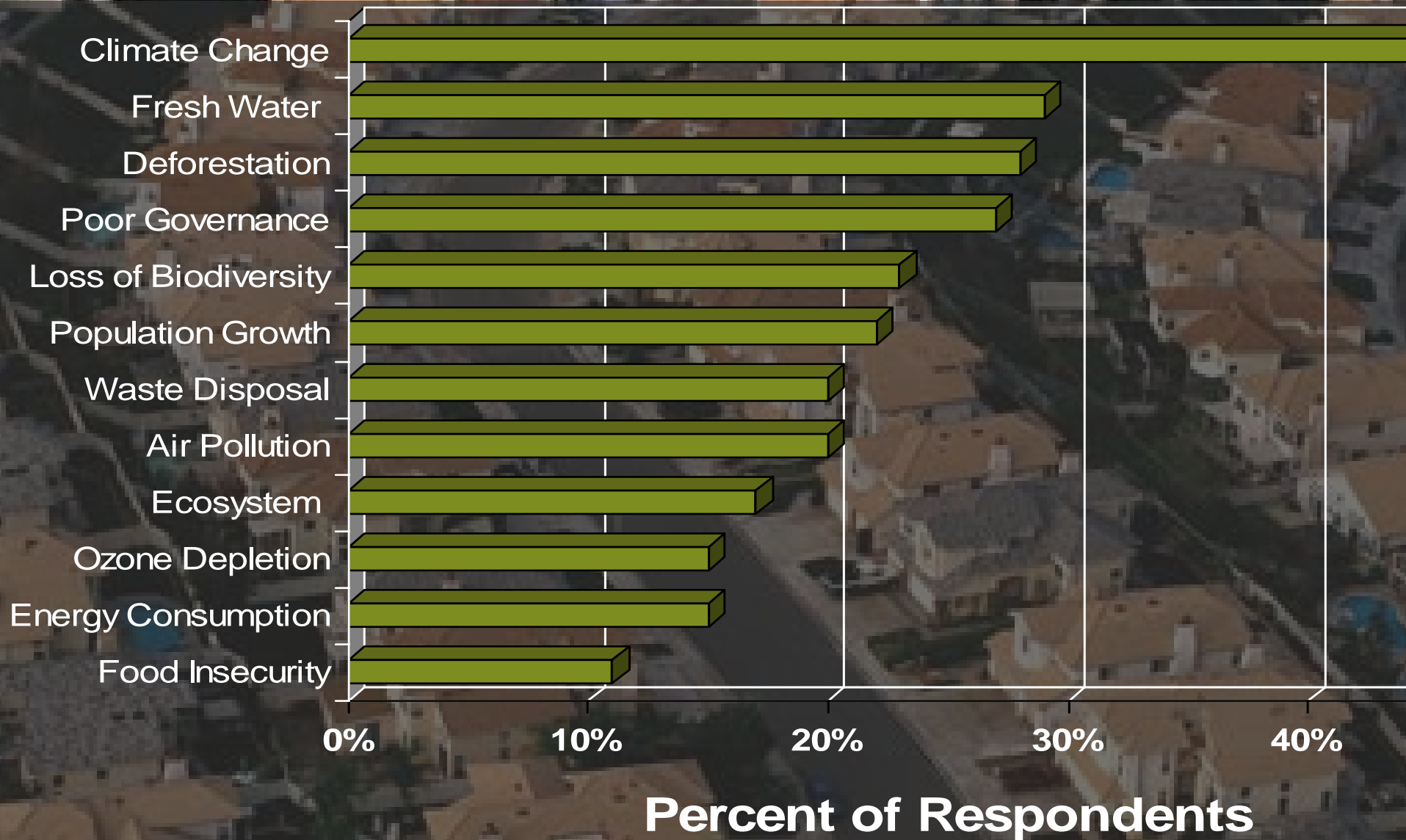
Rising Energy Prices

The CO₂ Record



Major Environmental Imperatives

Source: UNEP Survey of 200 Scientists in 50 Countries



The Home Building Industry's View



March 20, 2006

“Green home building is at a tipping point among the builder population”

As of 2006, 50% of builders “are focusing their attention on green building issues”

“It’s the right thing to do”

The Greenest House on the Planet



Reprinted from the September 11, 2006 issue of **BusinessWeek** magazine.

What is the Media saying about LEED Homes

More Positive Press

Date	Outlet	Headline
11/16/2006	AEC Café	U.S. Green Building Council Certifies First LEED(R) for Homes Project in Massachusetts
9/7/2006	Architectural Record	Prefab Homes Achieve LEED Platinum
9/7/2006	Architectural Record	Prefab Homes Achieve LEED Platinum
10/1/2006	Architectural Record	A model prefab house
9/29/2006	Associated Press (AP)	Green home dedicated in Freeport
9/30/2006	Associated Press (AP)	Latest Maine news, sports, business and entertainment
11/3/2006	Associated Press (AP)	Daybook Fri General
11/3/2006	Associated Press (AP)	Daybook Fri General
11/15/2006	Associated Press (AP)	CO Enterprise USGBC 11 15
11/15/2006	Associated Press (AP)	MA Green Blding LEED 11 15
11/20/2006	Atlanta Business Chronicle	Raising the 'green' bar Oregon home buyers quick to embrace 'green houses'
10/20/2006	Beaverton Valley Times	Realtors will offer green info for homes on regional market
9/29/2006	Boston Globe - Online	First LEED-certified home in Maine dedicated
9/29/2006	Boston Globe - Online	First LEED-certified home in Maine dedicated
9/30/2006	Boston Globe - South Bureau	First LEED-certified home in Maine dedicated
11/14/2006	Brown Alumni Magazine	Risking life and limb to ski the world?s toughest peaks
9/8/2006	Builder	List Service Notes Green Homes
10/17/2006	Building Design & Construction	New Idaho chapter of USGBC is growing
11/7/2006	Building Design & Construction	The Green Scene
11/16/2006	Building Design & Construction	First multi-unit project certified by USGBC



LEED
for HOMES



Perception

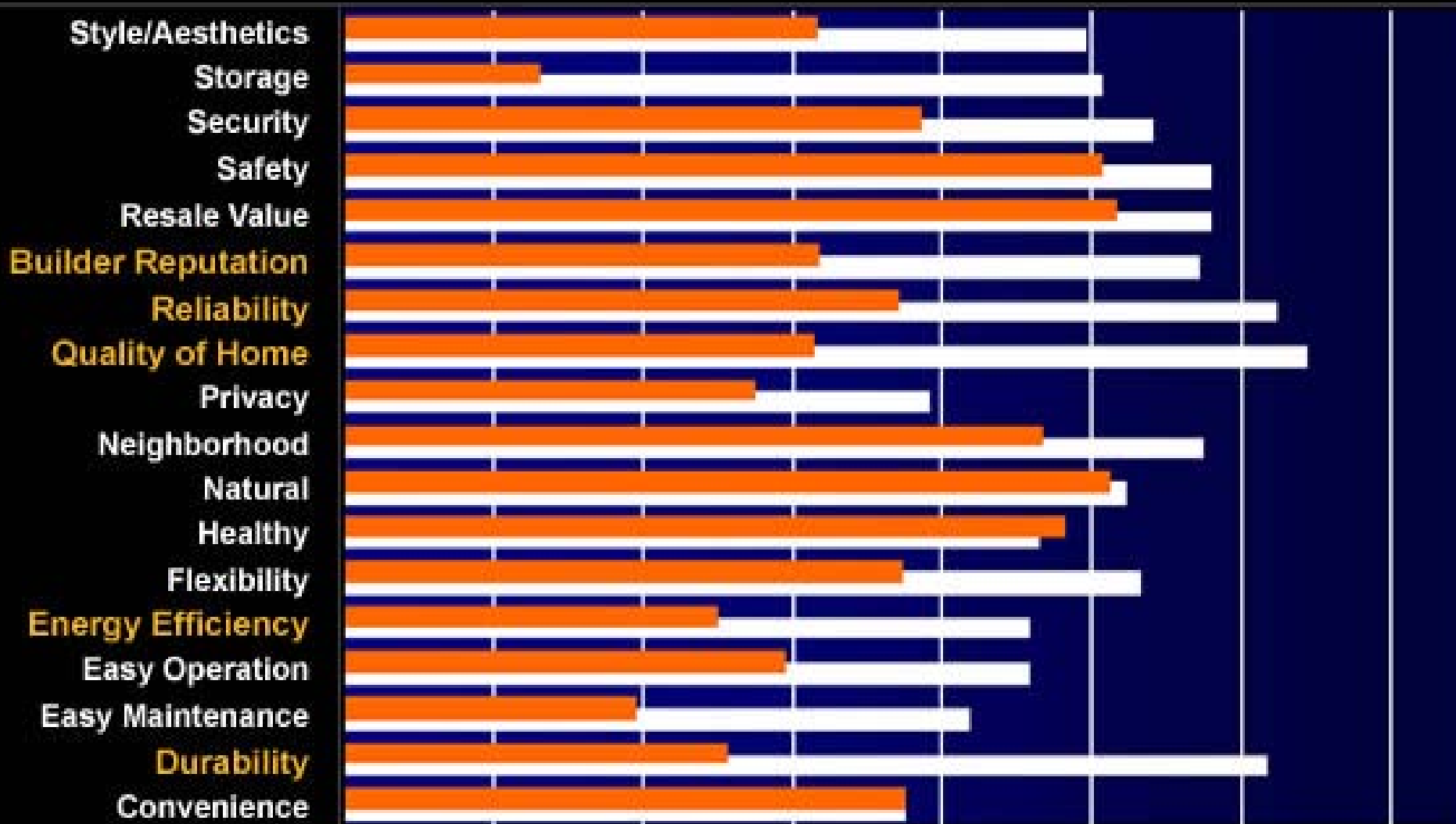
Reality



Reality



Home Owner's Priorities




What did they expect? 

How satisfied were they? 

Top 10 Problems Encountered by Home Inspectors

1. Minor maintenance problems
2. Minor structural problems
3. Grading/drainage problems
4. Older/insufficient electrical system
5. Older/poorly installed plumbing
6. Older/leaking roof
7. Older heating/cooling system
8. Poor ventilation
9. Excessive air leakage
10. Environmental problems

An aerial photograph of a suburban residential neighborhood. The houses are arranged in a grid-like pattern with a central road. The roofs are mostly brown and grey. There are some swimming pools visible in the backyards. A semi-transparent dark grey box is overlaid on the center of the image, containing the text "Emerging Business Opportunity" in white, bold, sans-serif font.

**Emerging
Business Opportunity**

Residential Building Types

Single Family



Market Rate
& Affordable

Multi-Family



Up to 3 Stories

Gut Rehab



Strip to Studs
on One Side

Why Build Green Homes?

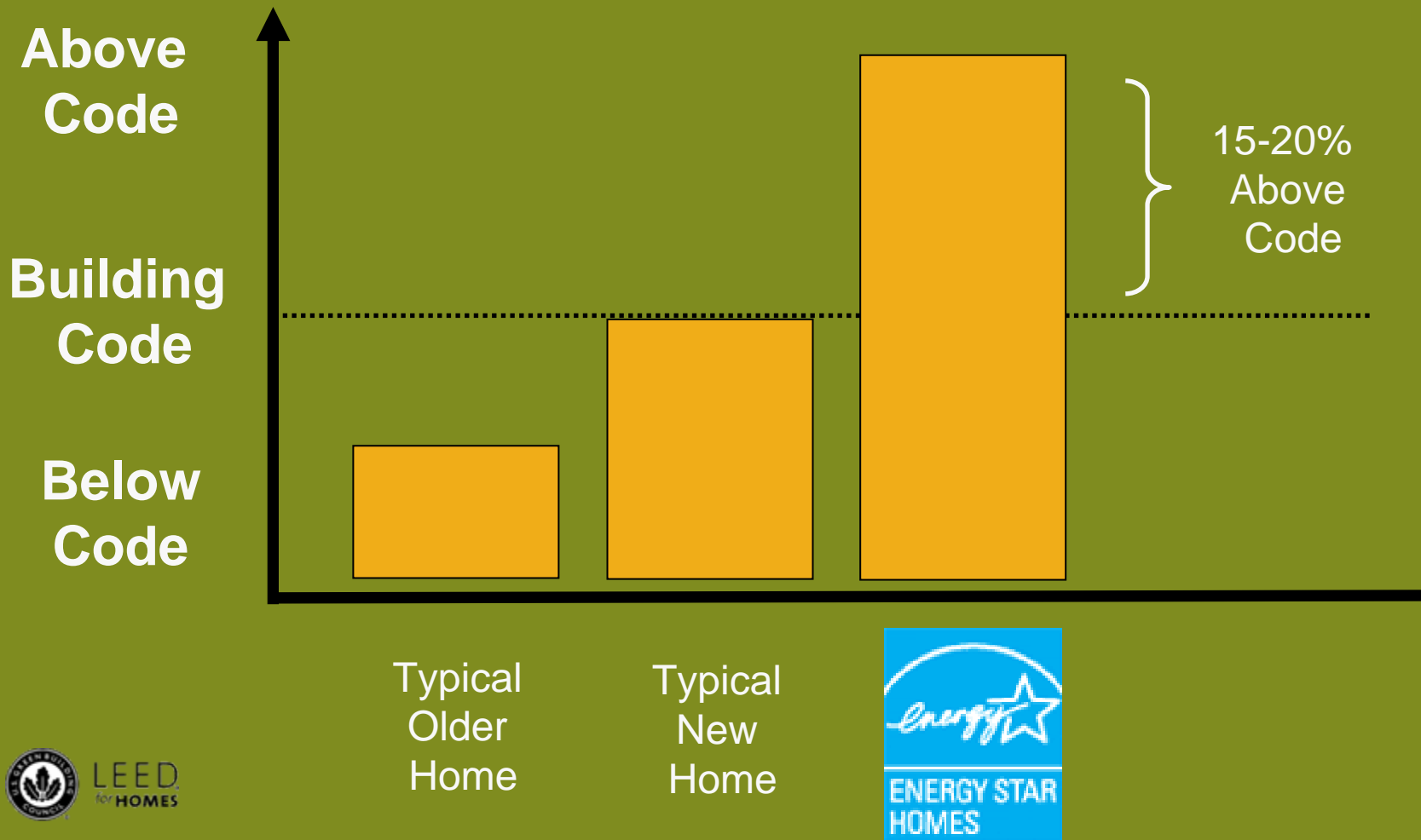
Builders Want To Differentiate Their Homes in the Market, in Terms of:

1. High Performance
2. High Quality (?)

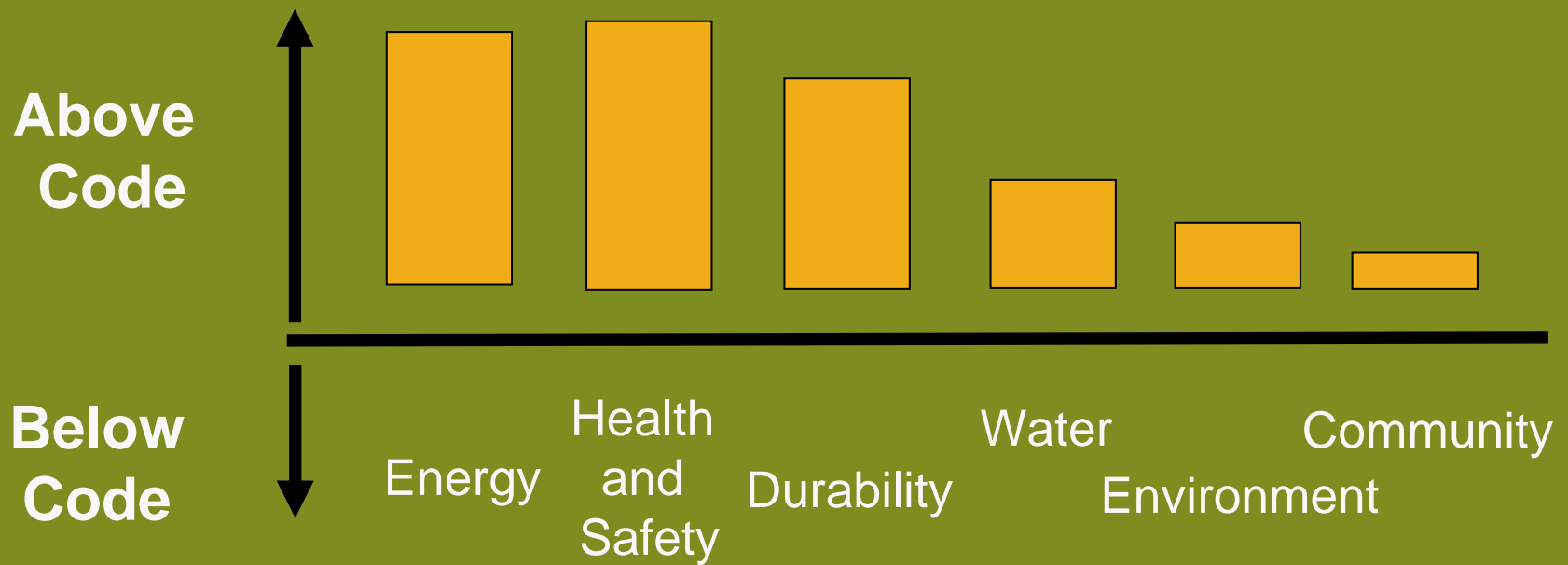


LEED[®]
for HOMES

What is an Above Code Performance?



What is High Performance?



What are Green Homes?



Builder A

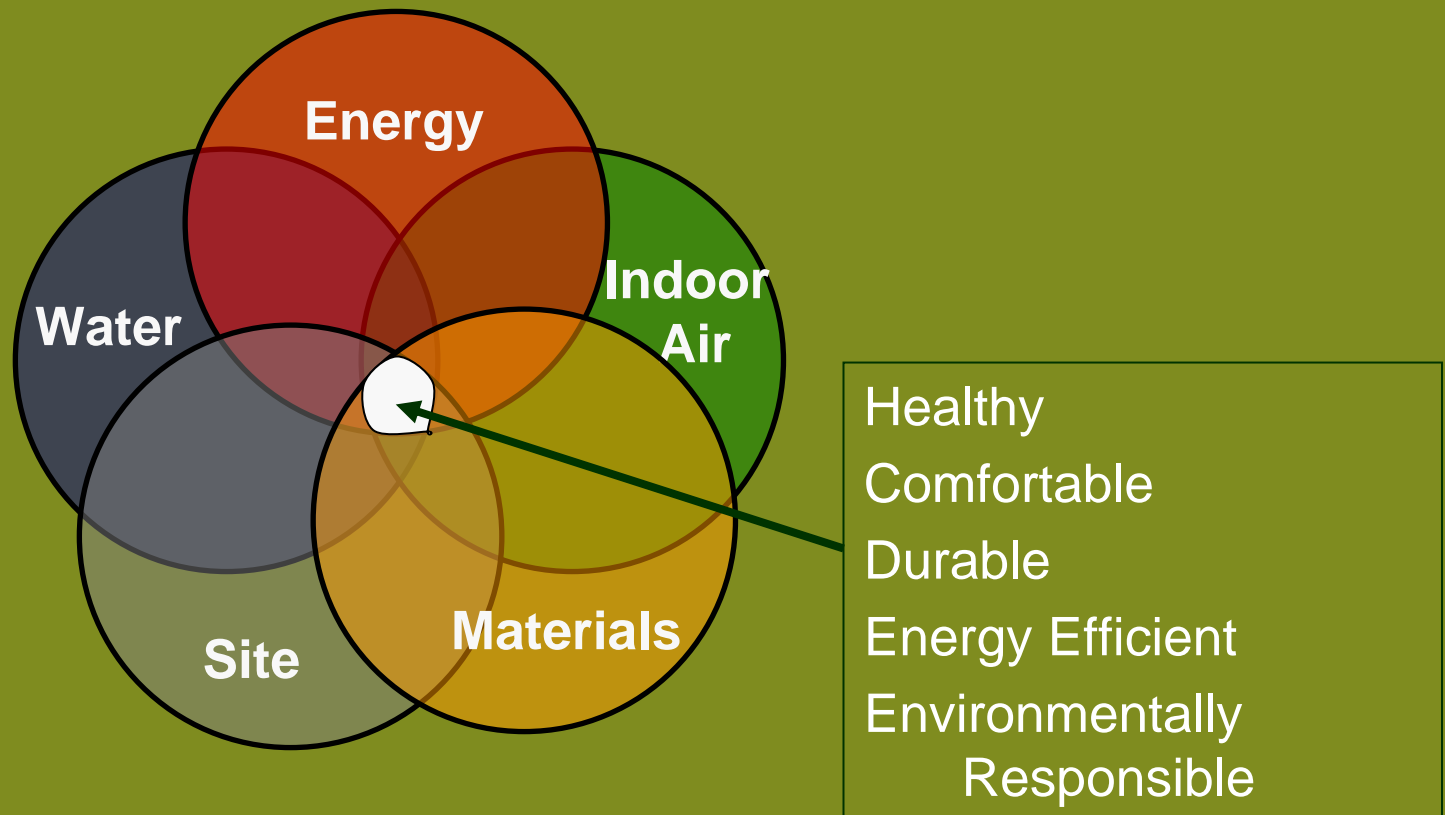


Builder B



Builder C

How Does LEED Define a Green Home?



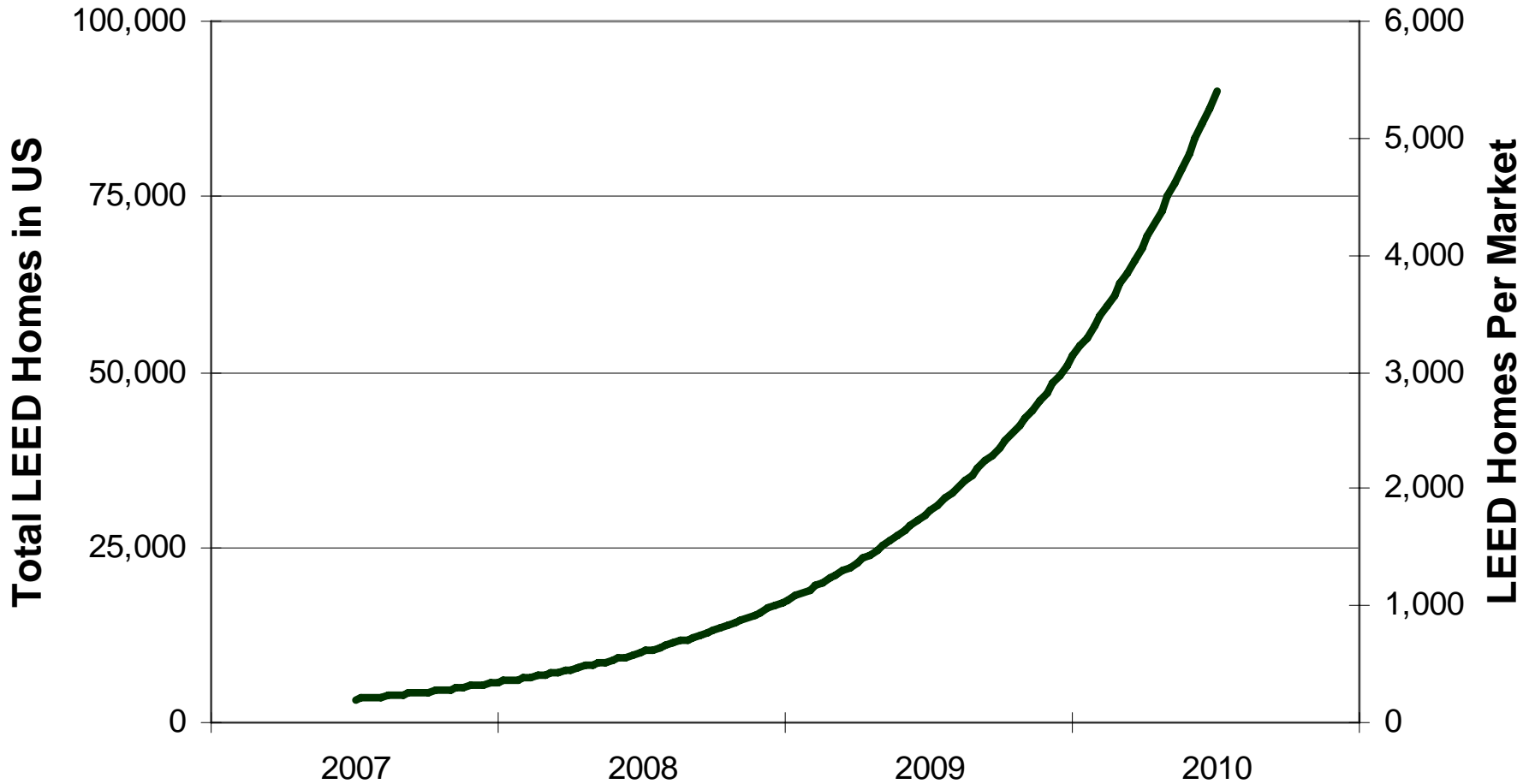
Pilot Status

Type of Participant	Registered
# of Providers	12
# of Builders	300
# of Homes	4300



LEED
for HOMES

Projected Growth: LEED for Homes



An aerial photograph of a suburban residential neighborhood. The houses are arranged in a grid-like pattern with winding streets. Many houses have reddish-brown roofs, and some have swimming pools in their backyards. A semi-transparent dark grey rectangular box is overlaid in the center of the image, containing white text.

Strategy for Collaboration w/ Other Programs

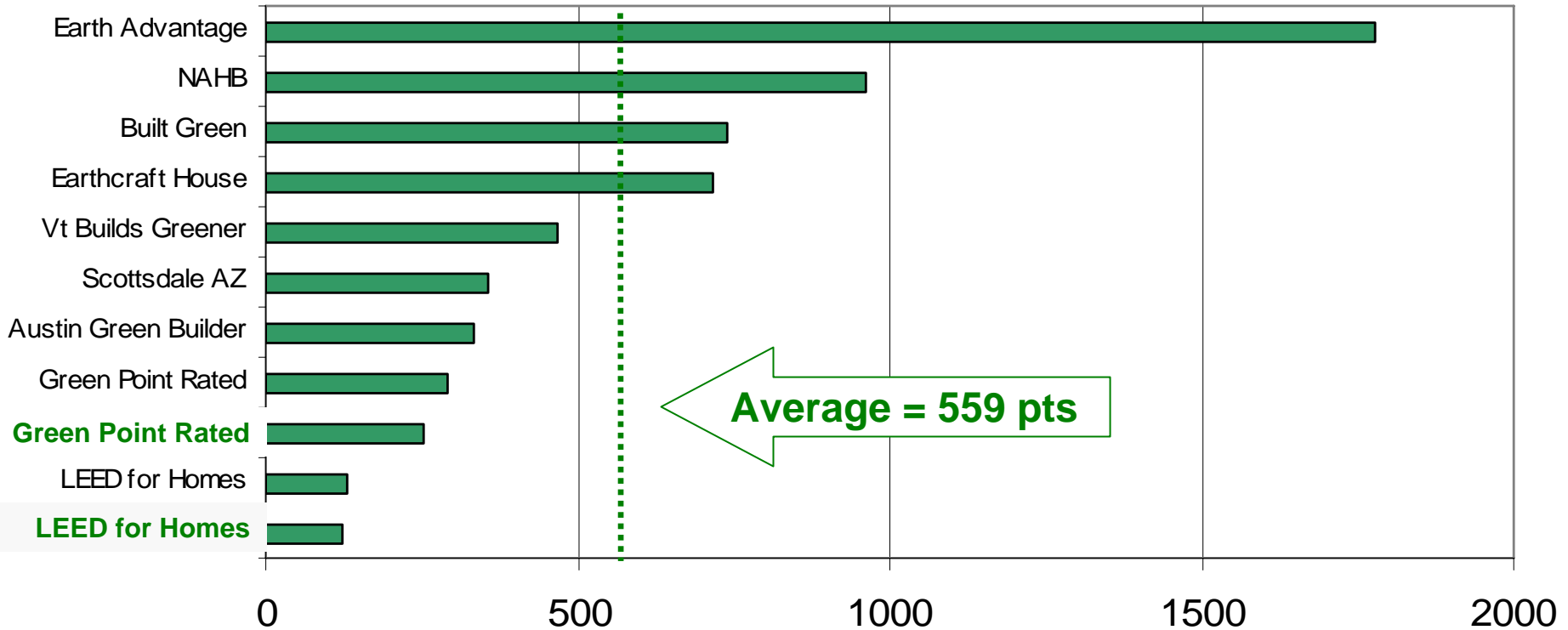
Green Home Building Programs

Alaska Craftsman Home Program, Inc. (ACHP)
APS Performance Built Homes™
Aspen Efficient Building Program
Aspen Energy's Green Building Program
Build Green Washington
Build It Green/GreenPoint Rated (2002)(2006)
Build San Antonio Green
Building America Program
Building Science Corporation
Built Green Colorado
Built Green NW
Built Green Santa Barbara
California ENERGY STAR® New Homes Program
California Green Building Program (CBG) (2001)
Chicago Center for Green Technology
Chula Vista GreenStar Building Efficiency Program (2000)
Consumer Products Program(VOC's)
Earth Advantage™ (1999-2005)
Earth Craft House™ (2003)
EcoBuild Program (2003)
Emerging Renewables Program Rebates
Engineered For Life™ (1998)
Environmentally Sustainable Affordable Design (ESAD) program
Environments for Living® (2001)/Diamond Class (2005)
E-Star Colorado
Florida Green Building Coalition, Inc.
Fore-Solutions
Forest City Development
Frisco Green Building Program (2001)
G/Rated (2001)
GHBA Green Building Program
Greater Cleveland Green Building Coalition (1999)/7-Chapters
Green Builder Program (1997) /Building America Partner Program (2001)
Green Building Alliance
Green Building Corps
Green Building Council
Green Building in Alameda County (2000)
Green Building Initiative of St. Louis
Green Built Program (2001)
Green Communities Initiative
Green Energy Ohio
Green Guidelines (2000)
Green Home Choice (2003)
Green Home Destination (2001)
Green Home Remodel (2004)
Green Homes NorthEast (GHNE)
Green Permit Program-Residential
Green Points Program (1997)
Green Points Remodeling Program (2001)
Green Roofs Program
GreenHOME(1999)
Greening Affordable Housing Initiative
Hawaii BuiltGreen (2001)
Health House® (1993) - St. Paul MN
Healthy Built Homes (2005)
Home Remodeling Green Building Guidelines(2001)
Innovative Building Review Program (1995)
Keystone Green Building Initiative
Laclede Gas/Inspections & Testing
Maryland Environmental Design Program (1998)
NAHB Model Green Home Building Program
NC HealthyBuilt Homes Program (2004)
New Jersey Affordable Green Program (1998)
Northeast Ohio Green Building Initiative
NWEBG-Northwest EcoBuilding Guild (1993)
Park City Green Building Initiative
Remodelers Advantage (2005)
Sonoran LEED for Homes/City of Scottsdale Green Building Program
Southern Nevada Green Building Partnership
Sustainable Building Program (2000)
Sustainable Development Initiative
Tacoma-Pierce County Built Green™ (2003)
TEP Guarantee Home Program (1997)
The Built Green™ Program (2000)
Unity Homes/Gulfport, Miss
Vermont Builds Greener Program (2003)
Wisconsin Green Building Alliance (WGBA)



Comparison of Green Building Rating Systems

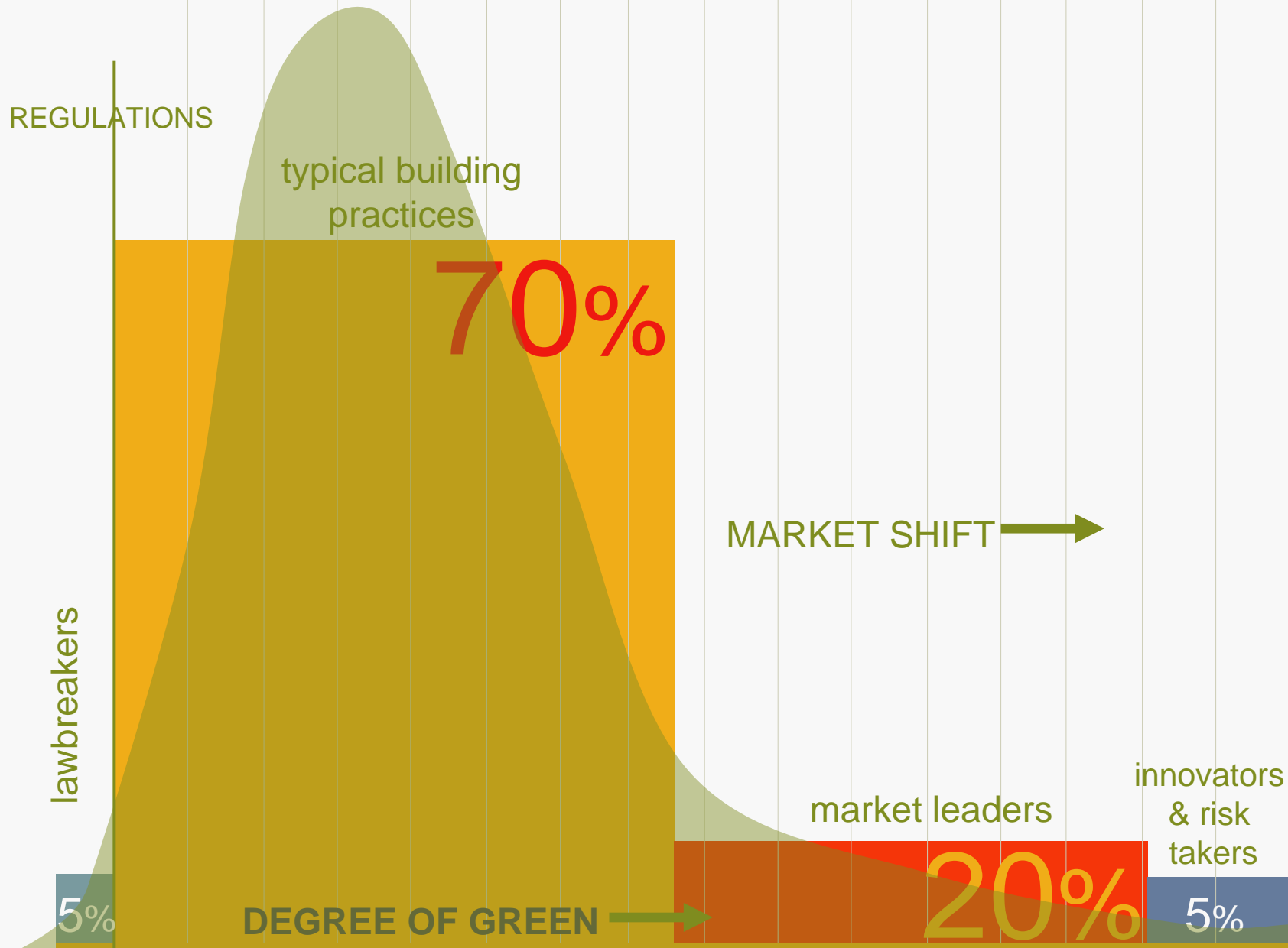
Total Number of Points



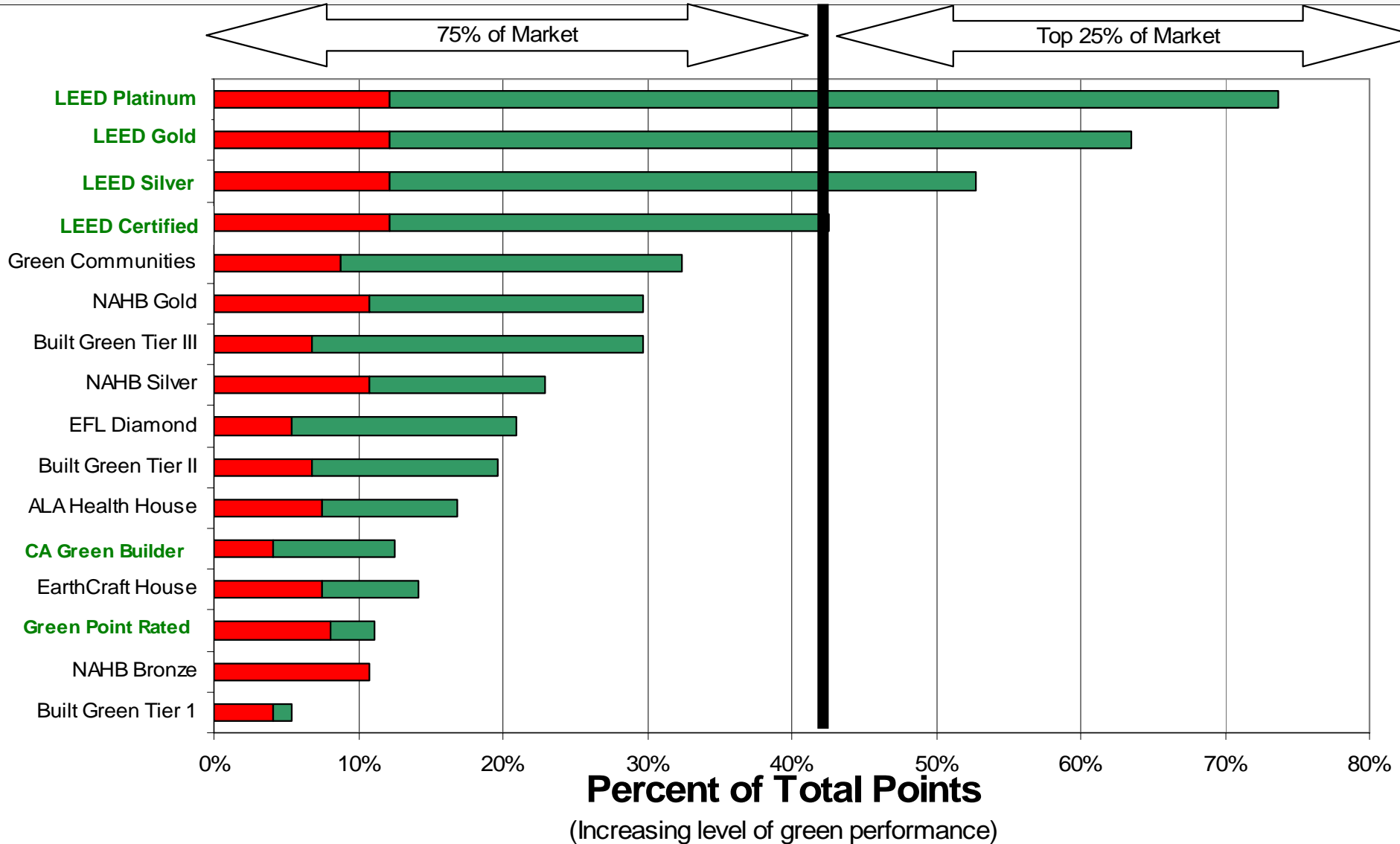
■ Features of Green Building Programs

- Rating System
 - Mandatory Measures
 - Optional Points
- Tiers
 - Stars, Tiers, Medals
- Credit Categories
- Certification Process
 - Builder, 3rd Party
 - Design, Inspections, Performance Testing
- Sampling / QA

Varying Performance Levels



Comparison of Green Building Rating Systems



How to Choose a Program?

1. What level of performance is desired?
2. Is it cost effective?
3. Is it delivered consistently?
(The Brand Promise)

LEED for Homes Alliances

National Programs

Local and Regional Programs



ENVIRONMENTS FOR Living



LEED
for HOMES

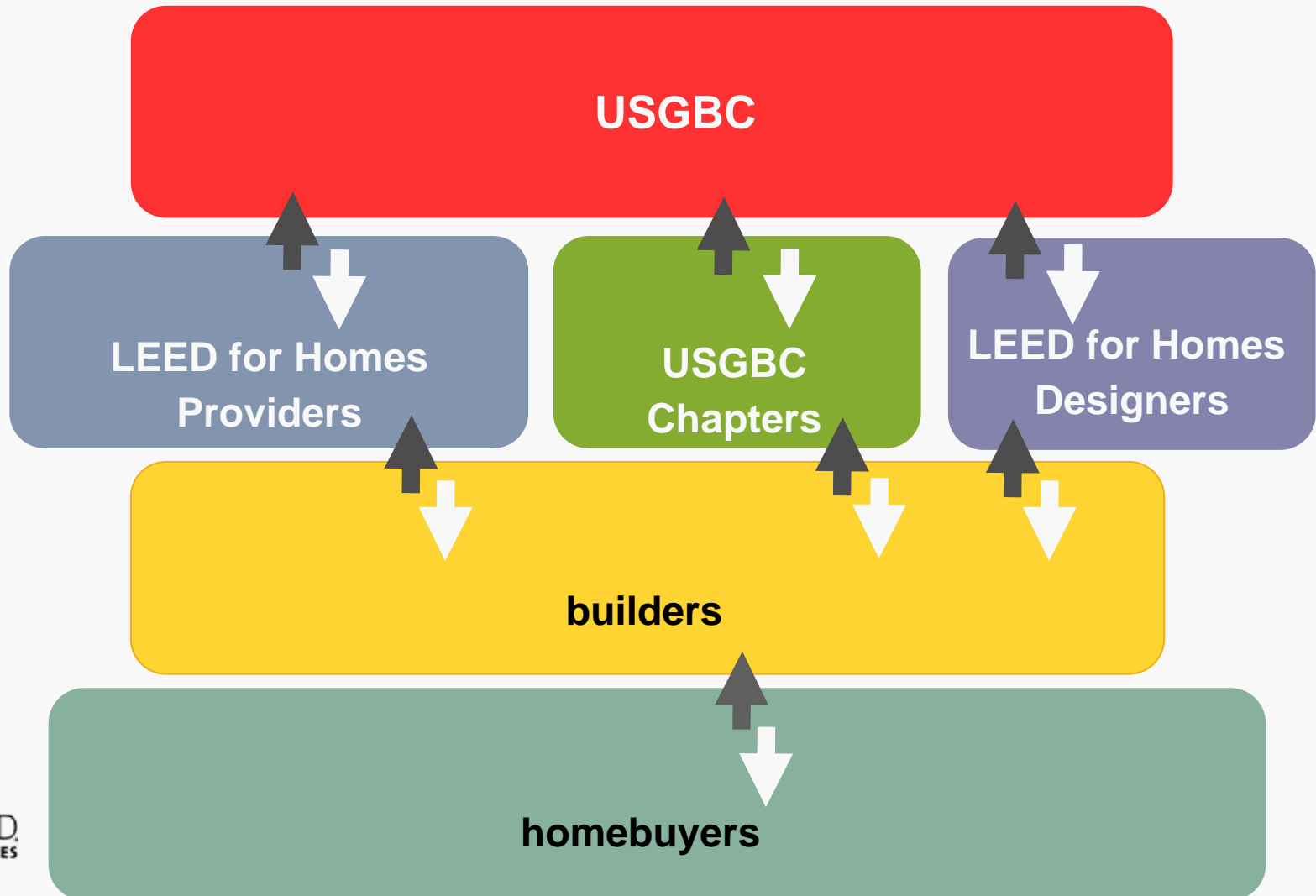


An aerial photograph of a suburban residential neighborhood. The houses are arranged in neat rows, separated by a central road. Many houses have orange or brown roofs, while others have grey roofs. There are some swimming pools visible in the backyards. A semi-transparent dark grey box is overlaid on the center of the image, containing the text "Overview of Certification Model" in white, bold, sans-serif font.

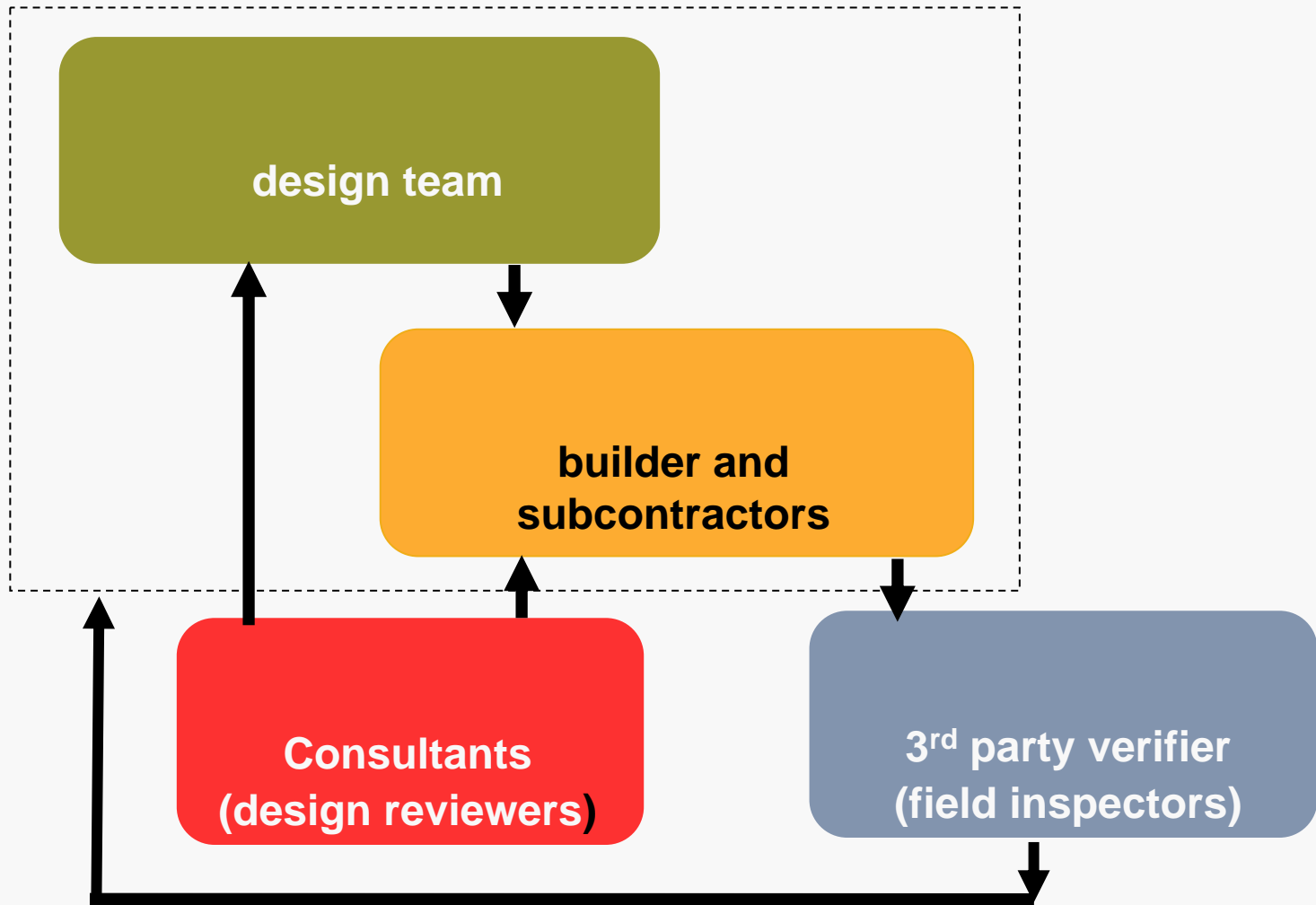
Overview of Certification Model

Roles of Key Stakeholders

(Decentralized and Localized)



Integrated Team



Types of 3rd Party Verification Tasks

- Design Reviews
- Inspections
- Performance Testing
- Documentation



Certification Model

Step 1: Plan Review (by green rater)

- 1.1 Detailed plan review of a builder's home design;
- 1.2 Performance testing of a typical example of builder's homes;
- 1.3 Identify additional measures that may be needed; and
- 1.4 Preliminary LEED for Homes score / rating.

Certification Model (cont'd)

Step 2: Intermediate Inspections (by green rater)

- 2.1 Pre-drywall inspection
- 2.2 Durability inspections
- 2.3 Erosion Controls

Certification Model (cont'd)

Step 3: Final Rating (by green rater)

- 3.1 Final inspection and performance testing;
- 3.2 Completion of project documentation file
(including: checklist, performance test reports,
and accountability form); and
- 3.3 Final LEED for Homes scoring / rating.




Certification Model (cont'd)

Step 4: Certification (by Provider)

- 4.1 Review of project documentation file that was prepared by the rater
- 4.2 Completion of LEED for Homes rating
- 4.3 Presentation of certificate to builder / homeowner.
- 4.4 Formally register certified LEED Home



Accountability Form

	LEED for HOMES	Accountability Form (Version 1.7, August 12, 2005)																																		
<p>All declarations and affirmations made in this accountability form are made to USGBC solely for the purpose of assisting USGBC in determining whether LEED Certification is merited. No such declaration or affirmation can be construed as a warranty or guarantee of the performance of the building.</p> <p>Instructions</p> <p>This form is to be completed by the person / organization responsible for the design and/or implementation of one or more of the LEED for Homes credits below. A separate form shall be completed by each design professional responsible for one or more credits.</p> <p>Step 1. Review the requirements for the credits in the LEED for Home Rating system for which you are responsible.</p> <p>Step 2. Complete the General Information section of this form.</p> <p>Step 3. Skip the Overall Performance Data section of the form (to be completed by Provider/Rater).</p> <p>Step 4. In the Areas of Accountability section, check boxes to indicate the LEED for Homes credits for which you have the primary design/implementation responsibility.</p> <p>Step 5. Complete the Official Certification section at the bottom of the form.</p> <p>Step 6. Maintain a project documentation file to assist in the event of an audit of your credit(s) or of this project by the USGBC.</p>																																				
General Information																																				
Builder Name: <input style="width: 90%;" type="text"/> Subdivision Name: <input style="width: 90%;" type="text"/> House Address: <input style="width: 90%;" type="text"/> Provider's Name: <input style="width: 90%;" type="text"/> Rater's Name: <input style="width: 90%;" type="text"/> Sampling Protocol Used: <input style="width: 10%;" type="text"/> (Y / N)																																				
Overall Performance Data																																				
LEED Score: <input type="checkbox"/> / 100 Points LEED Rating Achieved: <input type="checkbox"/> (Certified, Silver, Gold, Platinum) HERS Score Achieved: <input type="checkbox"/> / 100 Points																																				
Areas of Accountability																																				
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Meets ASHRAE Std 62.2</td></tr> <tr><td><input checked="" type="checkbox"/> 6.1 Supply Air Distribution; ACCA Manual D</td></tr> <tr><td><input checked="" type="checkbox"/> 9.1 Radon Protection; Install System, EPA Zone 1</td></tr> <tr><td><input checked="" type="checkbox"/> 9.2 Radon Protection; Install System, Not EPA Zone 1</td></tr> <tr><td style="background-color: #e0e0e0;">Homeowner Awareness</td></tr> <tr><td><input type="checkbox"/> 1.1 Basic Owner's Manual & Walkthrough</td></tr> <tr><td><input type="checkbox"/> 1.2 Comprehensive Manual & Multiple Walkthroughs</td></tr> </table>	Location & Linkages	<input checked="" type="checkbox"/> 2 Site Selection	<input checked="" type="checkbox"/> 5.1 Average Housing Density \geq 7 Units / Acre	<input checked="" type="checkbox"/> 5.2 Average Housing Density \geq 10 Units / Acre	<input checked="" type="checkbox"/> 5.3 Average Housing Density \geq 20 Units / Acre	Sustainable Sites	<input type="checkbox"/> 2.1 Basic Landscaping Design	<input type="checkbox"/> 2.4 Minimize Landscape Water Demand	Indoor Environmental Quality	<input checked="" type="checkbox"/> 3 Humidity Control System	<input checked="" type="checkbox"/> 4.1 Outside Air Ventilation; 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<input type="checkbox"/> 1.4 Provide Description and Justification																																				
Official Certification (to be Completed After Final LEED for Homes Rating)																																				
By affixing my signature below, the undersigned does hereby declare and affirm to the USGBC that the LEED for Homes requirements, as specified in the LEED for Homes Rating System, have been met for the indicated credits and will, if audited, provide the necessary supporting documents (drawings, calculations, etc.).																																				
Responsible Party		Date																																		
Printed Name		<input style="width: 90%;" type="text"/>																																		
Project Role / Title		<input style="width: 90%;" type="text"/>																																		
Organization / Company		<input style="width: 90%;" type="text"/>																																		
Signature		<input style="width: 90%;" type="text"/>																																		

Anticipated Effort for Verification

Type of Verification Activity	No. of Hours Required	
	ENERGY STAR	Other
Preliminary Rating	4	
Intermediate Inspections		
Final Review	6	
Travel Time	0.5	
Total Hours		
w/ Preliminary Rating	10.5	
w/o Preliminary Rating	6.5	

LEED for Homes Fees

USGBC

- Builder Registration \$150 for Pilot
- Certification Fee \$50 Per LEED Home

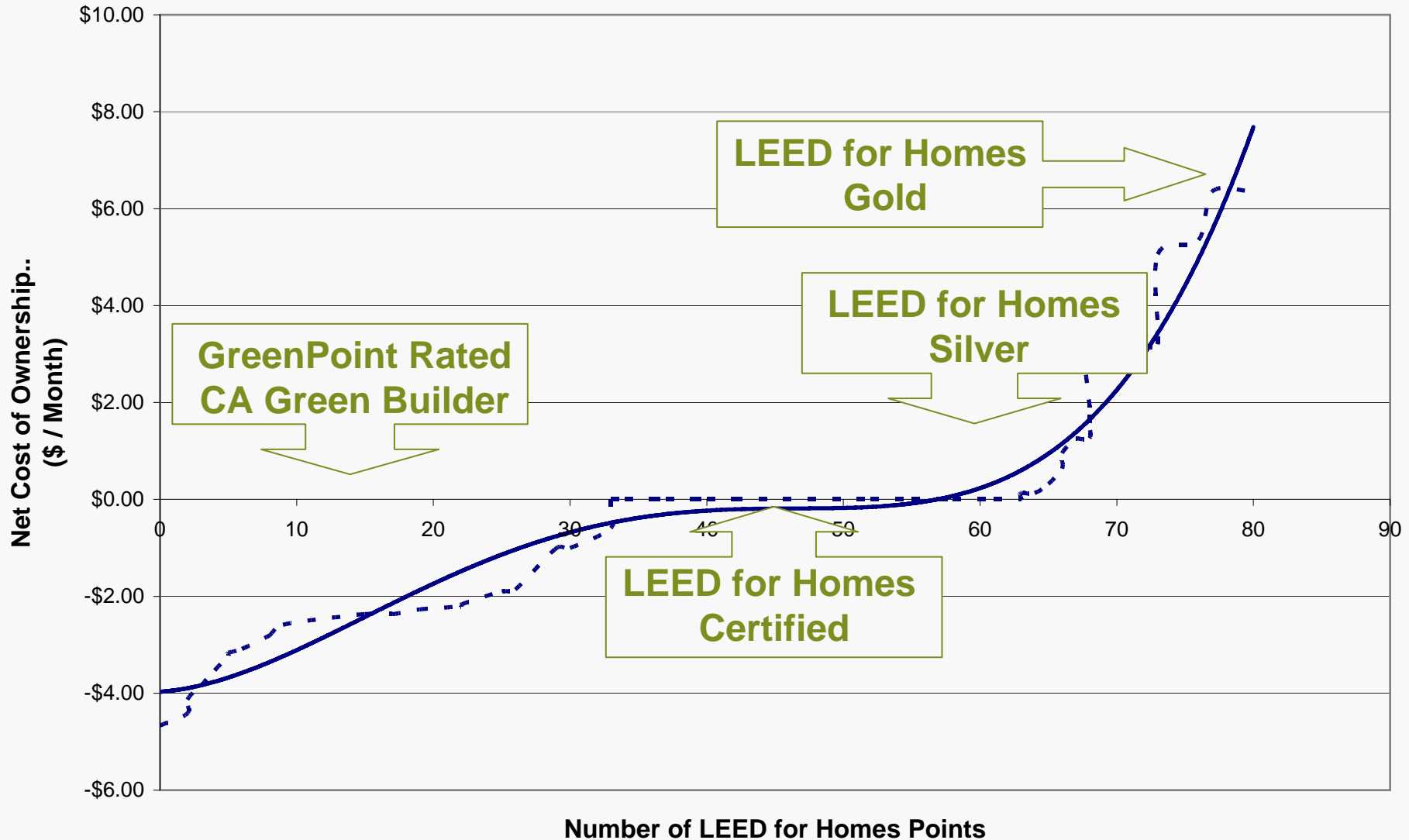
Provider

- LEED for Homes Ratings (Ask Your Local Provider)
 - Preliminary Design Review \$ 300 - 600
 - Inspections and Certification \$ 600 - 1,200
- With Sampling (high volume) \$250 - 500

Other Support

- Design Assistance \$ Variable
- Training \$ Variable

Net Cost of Ownership: All Measures



Benefits of a Green Home

List of Features / Benefits	LEED Home	Other Home
Higher quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>
30-50% more energy efficient	<input checked="" type="checkbox"/>	<input type="checkbox"/>
More comfortable living environment	<input checked="" type="checkbox"/>	<input type="checkbox"/>
30-50% more water efficient	<input checked="" type="checkbox"/>	<input type="checkbox"/>
More durable home design and materials	<input checked="" type="checkbox"/>	<input type="checkbox"/>
100 cfm of fresh air every hour	<input checked="" type="checkbox"/>	<input type="checkbox"/>
50% better air filtration	<input checked="" type="checkbox"/>	<input type="checkbox"/>
30-50% of building materials are environmentally preferable	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Non-toxic pest management	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ozone safe refrigerant	<input checked="" type="checkbox"/>	<input type="checkbox"/>
50% less waste to landfill (during construction)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
30% less stormwater run-off (less pollution into watersheds)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Higher resale	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Affordable Housing

Recognize and reward the intrinsic resource efficiencies of affordable housing

- Awareness and Education
- Tools
- Technical Support



Summary

- Growing Demand for Ratings X 2
- Higher Rating Fees Per Home X 2
- Overall Business Growth Opportunity X 4



An aerial photograph of a residential neighborhood. The houses are densely packed, with many featuring swimming pools in their backyards. The roofs are mostly light-colored, and the streets are paved. The overall scene is a typical suburban or residential area.

Thank You!

LEED for Homes Provider in CA:

**Davis Energy Group
Sacramento, CA**

USGBC Key Contacts

US Green Building Council Staff

Administrative and Technical / Verification Questions

Jay Hall, Acting LEED for Homes Program Manager,
Building Knowledge, Inc.

410 263-3162 jayh@buildingknowledge.net

Emily Mitchell, Assistant Program Manager

202 587-7187 emitchell@usgbc.org

LEED for Homes Committee Chairs

Programmatic Questions and Suggestions

Steve Winter, Steven Winter Associates

203 857-0200 sw@swinter.com

Kristin Shewfelt, E-Star Colorado

303 297-7499 kshewfelt@e-star.com