

transforming
the
built
environment



LEED
for **HOMES**

LEED for Homes:

**What it
Means to the
Building
Performance
Industry**

San Antonio, TX

February 28, 2006

Overview

- ☐ What is HERS Business Model?
- ☐ What is LEED for Homes?
- ☐ Verification Services Needed
- ☐ Pilot Schedule
- ☐ A Provider's POV
- ☐ What's Next



LEED[®]
for HOMES

PERCEPTION



REALITY



What is the Typical Business Model for the Building Performance Industry?

To Help Builders To Differentiate their Homes in the Market, in Terms of:

1. High Performance
2. High Quality (?)



LEED
for **HOMES**

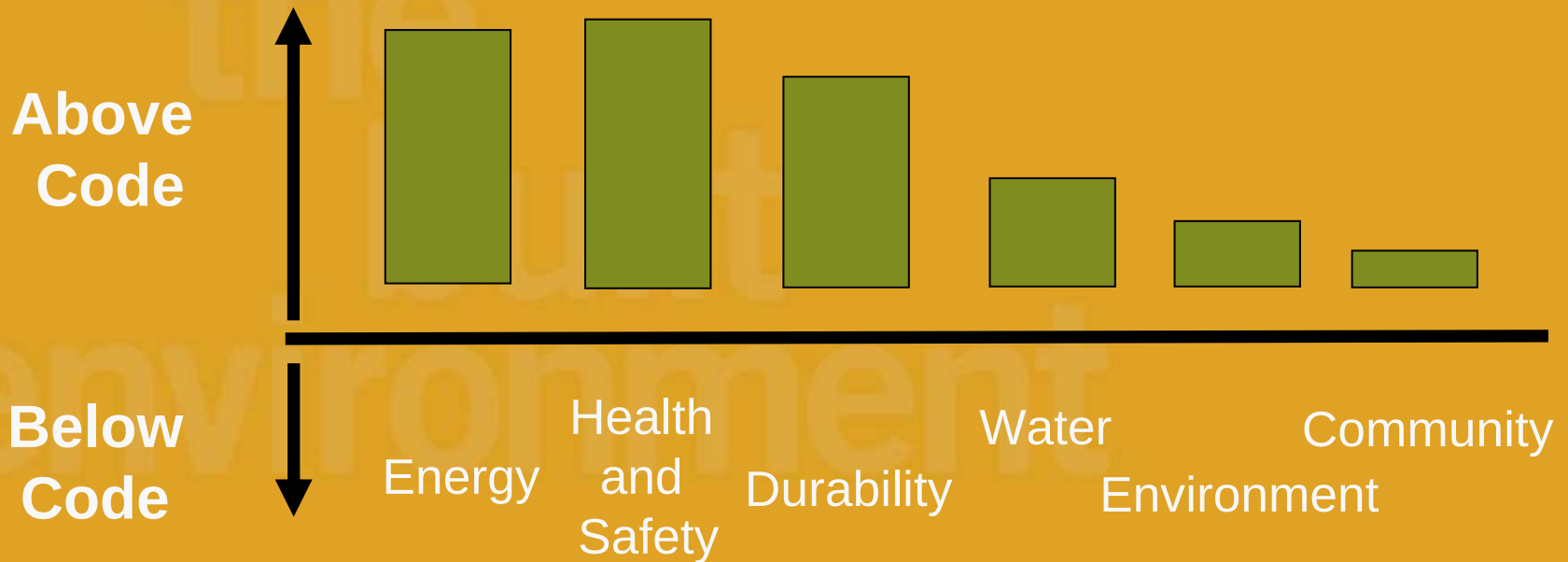
What Services are Offered by HERS Professionals?

A Suite of “Performance Assurance” Related Services

Design Reviews Product Sales Installation Services Inspections Performance Testing **HERS Ratings**

Project Timeline

What is High Performance?



LEED
for **HOMES**

Energy

>/= 35% Reduction

Annual Use:

~ 110 MBtu / Yr
~ 800 Gallons
Fuel Oil (equiv.)
~ \$2,500



Annual

Pollution:

~ 12 Tons CO₂
(equiv. to 2 cars)

Other Considerations

~ 100 Watts / SF Available Solar
(70% Effic. Thermal Solar; 10% Effic. PV)

<i>Summary of Benefits</i>	<i>Assumptions</i>	<i>\$/Month</i>	<i>\$/Day</i>
Cost of Measures	\$3,000	\$20	\$0.50



LEED
for **HOMES**

Water

>/= 40% Reduction (Indoors and Outdoors)

Annual Use:

~ 100 Gal / Person
/ Day
~ 100,000 Gal. / Yr
~ \$ 400



Annual Waste:

Sewer
~ 50,000 gal.
Irrigation
~ 50,000 gal.

Other Considerations

~ Rainfall (30 in/yr = 200,000 gal/yr)

<i>Summary of Benefits</i>	<i>Assumptions</i>	<i>\$/Month</i>	<i>\$/Day</i>
Cost of Measures	\$1,000	\$5	\$0.20
Water Savings (40%)	-\$150 / Yr	-\$15	-\$0.50
Net Cost of Measures		-\$10	-\$0.30



LEED
for **HOMES**

IEQ

>/= ? % Reduction (Pollutants)

Fresh Air:

~ 0.15 ACH
(50 cfm)
natural leakage

~ 0.15 ACH
(50 cfm)
mechanical
ventilation



Exhausted

"Pollutants":

CO
VOCs
Dust
Pollen
Moisture
Radon

Other Considerations

- ~ Value of Health & Safety?
- ~ Value of Improved Comfort?

Summary of Benefits	Assumptions	\$/Month	\$/Day
Cost of Measures	\$2,500	\$15	\$1.00
Savings	\$? / Yr	\$0	\$0.00
Net Cost of Measures		\$15	\$1.00

Materials

>/= 50% Reduction (Waste)

Materials:

- ~ 200,000 Lbs
- ~ 100 Tons
- ~ \$70,000

Environmentally Preferable:

- Recycled Materials
- Sustainably Harvested Materials
- Low Emission Products
- Advanced Framing
- Local Sources



Waste:

- ~ 8,000 Lbs
- ~ 4 Tons
- ~ \$3,500
(*& pay \$2,000 to haul away*)

Other Considerations

- ~ Durability: Value of Increased Lifetime (25 yrs vs 100 yrs)?

<i>Summary of Benefits</i>	<i>Assumptions</i>	<i>\$/Month</i>	<i>\$/Day</i>
Cost of Measures (+3%)	\$2,500	\$15	\$0.50
Savings (50%)	-\$2,500	-\$15	-\$0.50
Net Cost of Measures		\$0	\$0.00



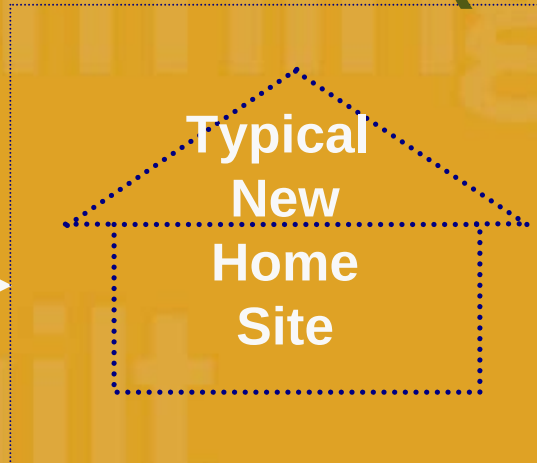
LEED
for **HOMES**

Building Site

>/= ? % Reduction (Pollution)

Surface Water

- ~ Rain: 15 inch / yr
(100,000 Gal / Yr)
- ~ Irrigation: 1" / hr
(50,000 Gal / Yr)



Erosion / Run-Off
Damage to
Rivers
Lakes
Wildlife

Chemicals

Fertilizers
Pesticides

Other Considerations

- ~ Landscaping / Permeability of Site
- ~ Community Benefits of Rain Pond

<i>Summary of Benefits</i>	<i>Assumptions</i>	<i>\$/Month</i>	<i>\$/Day</i>
Cost of Measures	\$2,500	\$15	\$0.50
Savings			
Net Cost of Measures		\$15	\$0.50



LEED
for **HOMES**

Location

>/= 50% Reduction (Gas \$)

Long Distance Commute

- ~ 30 miles / day
- ~ 15,000 miles / yr
- ~ 15 mpg
- ~ 1,000 gal /yr
- ~ \$2,500 / yr



Short Commute

- ~ 5 miles / day
- ~ 2,500 miles / yr
- ~ 30 mpg
- ~ 100 gal /yr
- ~ \$250 / yr

Other Considerations

- ~ Numerous Local Car Trips
- ~ Local Community Resources (retail, schools, etc.)
- ~ Average Housing Density in Community

Summary of Benefits	Assumptions	\$/Month	\$/Day
Cost of Measures	0	\$0	\$0.00
Savings	\$2,000 / yr	-\$150	-\$5.00
Net Cost of Measures		-\$150	-\$5.00



LEED
for **HOMES**

Summary of Benefits

Type of Resource	Monthly Cost (\$/Month)	Monthly Savings (\$/Month)	Net Cost of Measures (\$/Month) (\$/Day)
Energy	\$20	-\$70	-\$50 -\$1.70

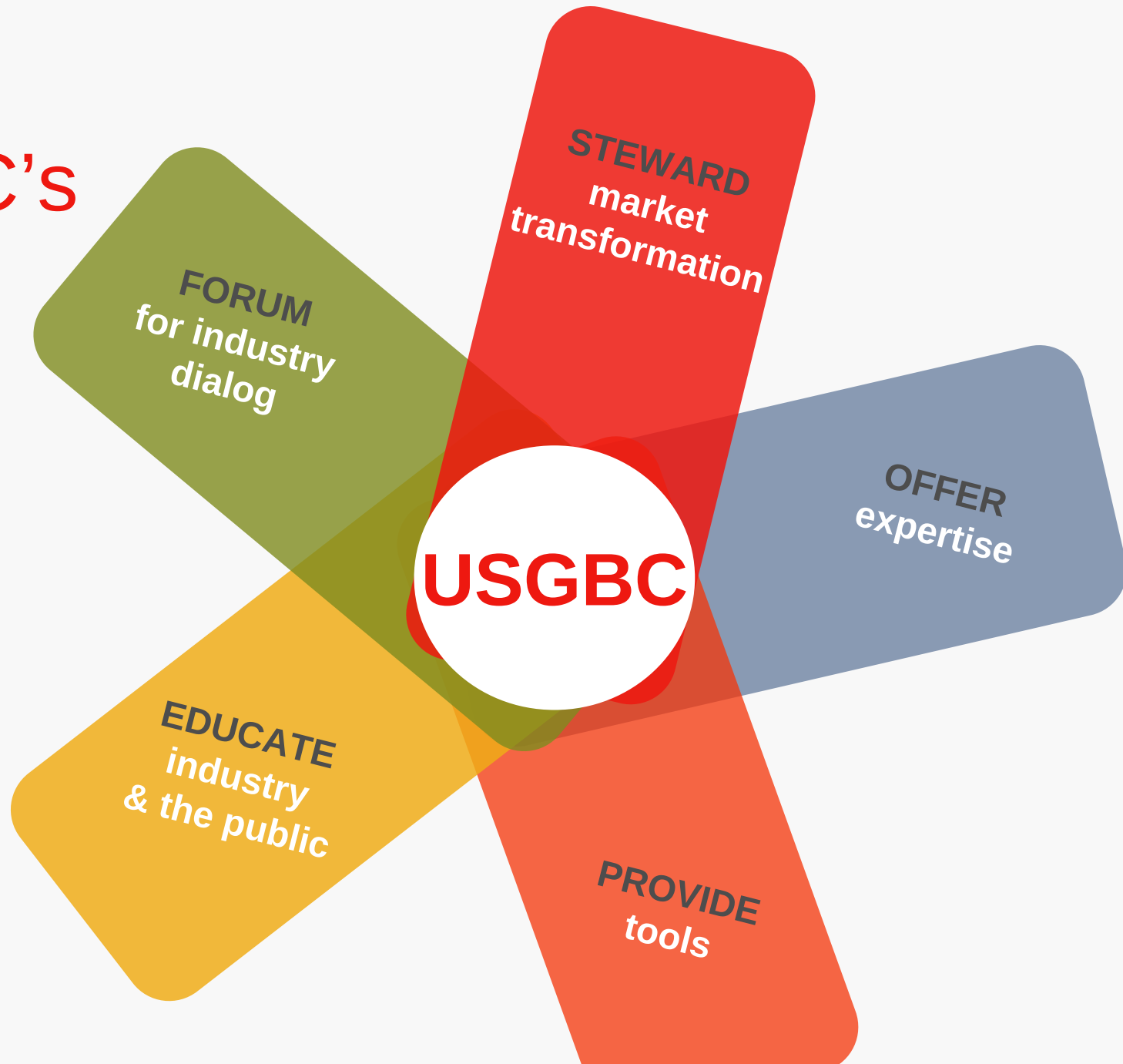
Intro to USGBC and LEED for Homes Pilot



LEED.
for HOMES



What is USGBC's Role?



USGBC Membership



TOTAL MEMBERS

5000

4000

3000

2000

1000

10
1995

61
1996

102
1997

158
1998

268
1999

570
2000

1137
2001

2370
2002

3532
2003

5016
2004

5617
2005

and 22,000 LEED APs

huge growth in last 5 years

steady growth in the first 5 years

What is the LEED System?

Leadership in Energy and Environmental Design

A leading-edge
system for
certifying
the greenest
performing
buildings in the
world



LEED RATING SYSTEMS

LEED-NC new construction

LEED-EB existing buildings

LEED-CI commercial interiors

LEED-CS core & shell

LEED for HOMES

LEED-ND neighborhood development

Commercial Buildings

Low-Rise Housing

Mixed-Use Developments

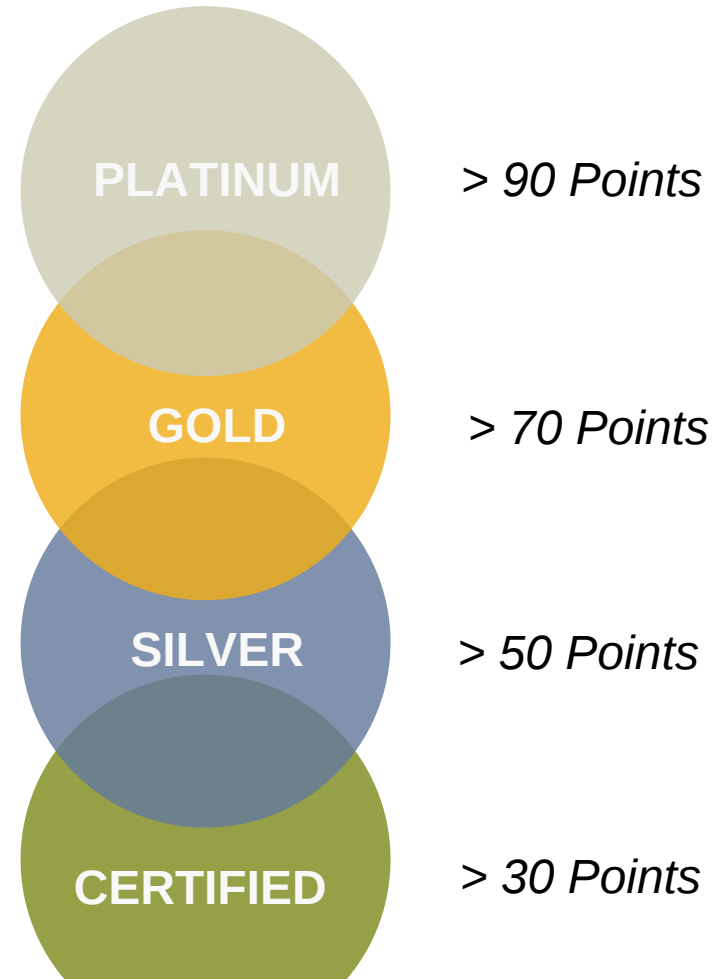
- Retail
- Multi-building Campuses
- Multi-family Residential

application guides



Consensus-Based Standards

USGBC has four levels of LEED:



TARGET MARKET

REGULATIONS

typical building practices

70%

Substantive

❖ To differentiate green building that are in top 25% of market
(based on performance, and environmental responsibility)

MARKET SHIFT →

lawbreakers

market leaders

innovators & risk takers

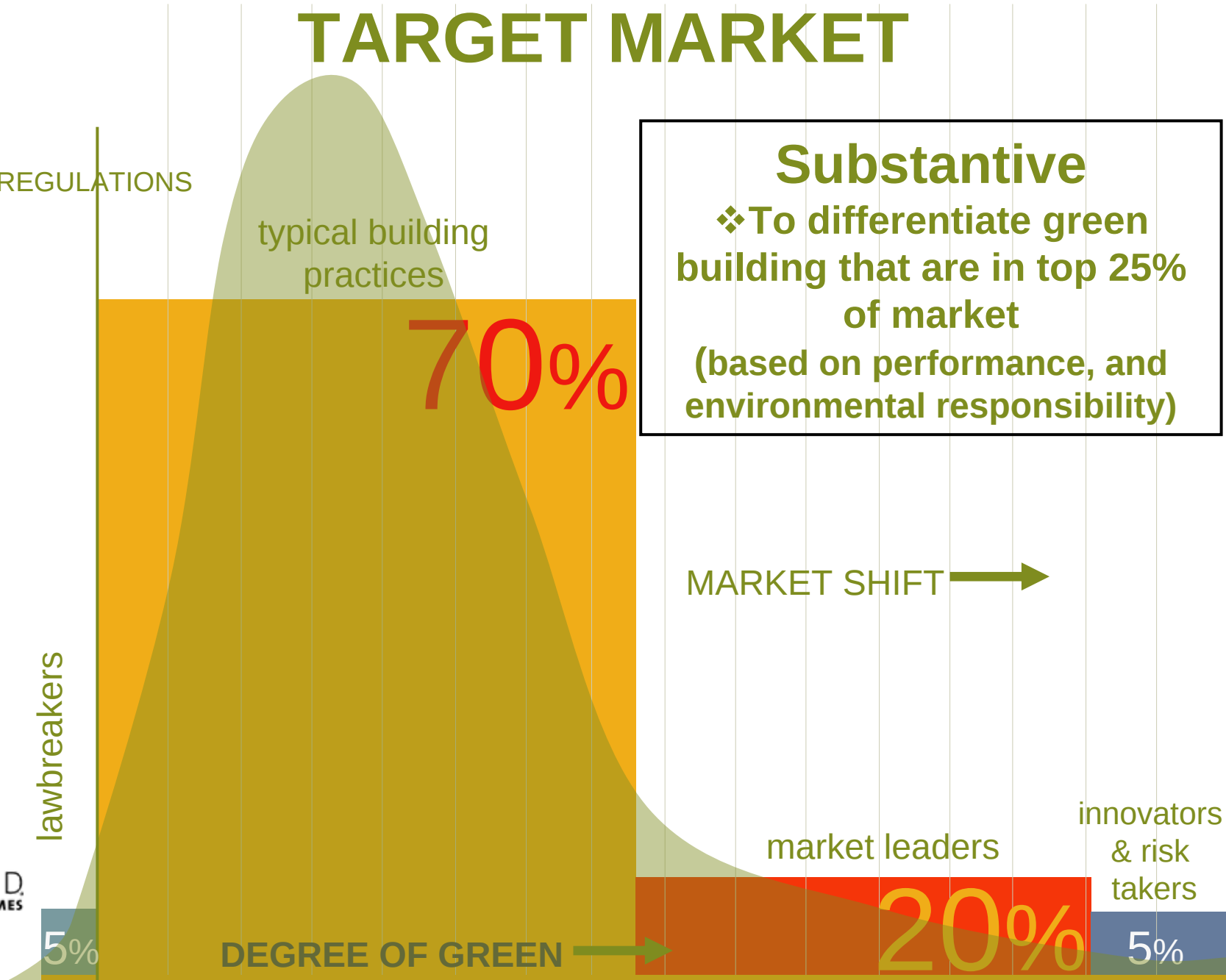


5%

DEGREE OF GREEN →

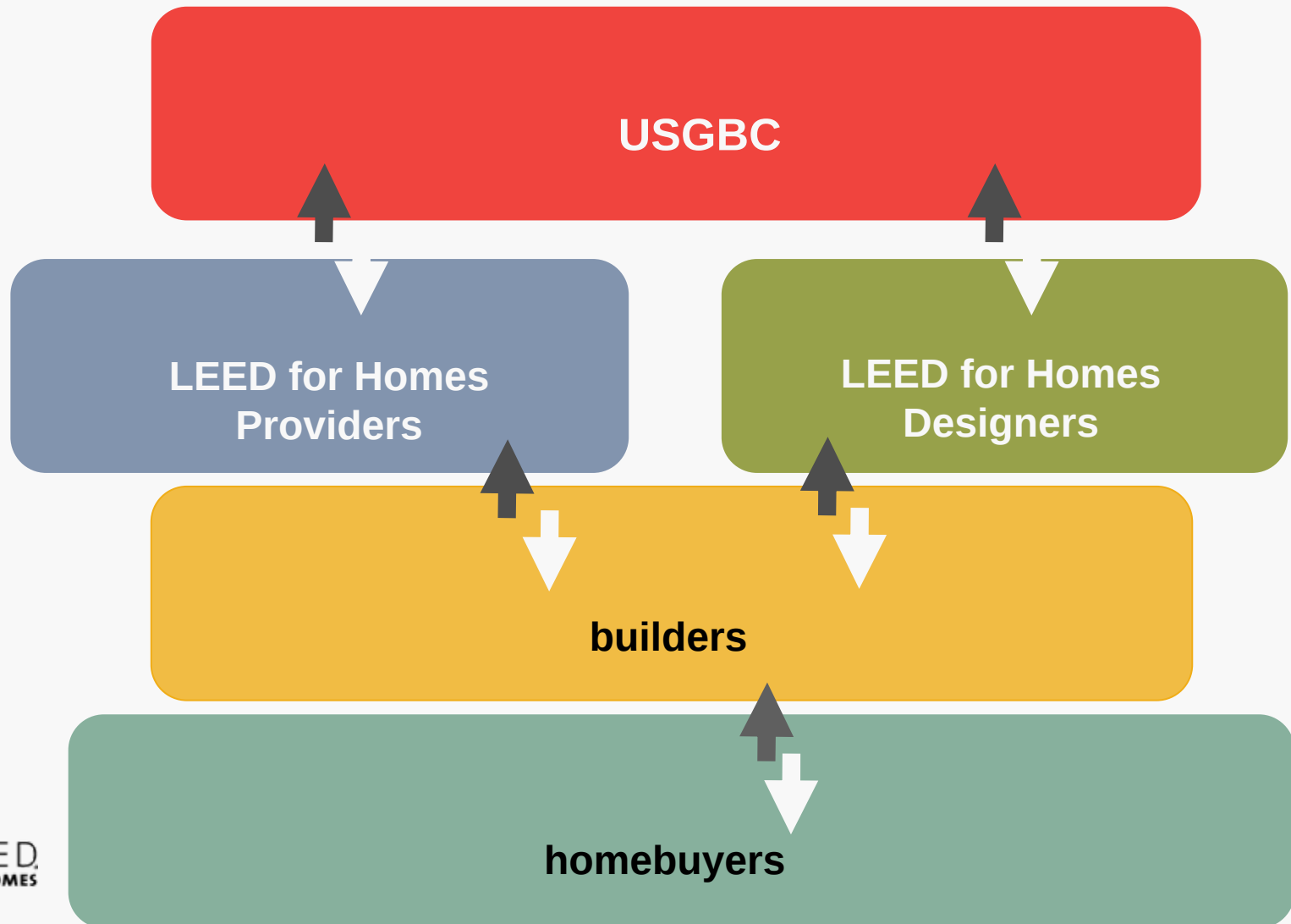
20%

5%



Roles of Key Stakeholders

(Decentralized and Localized)



The Growth of Green Building

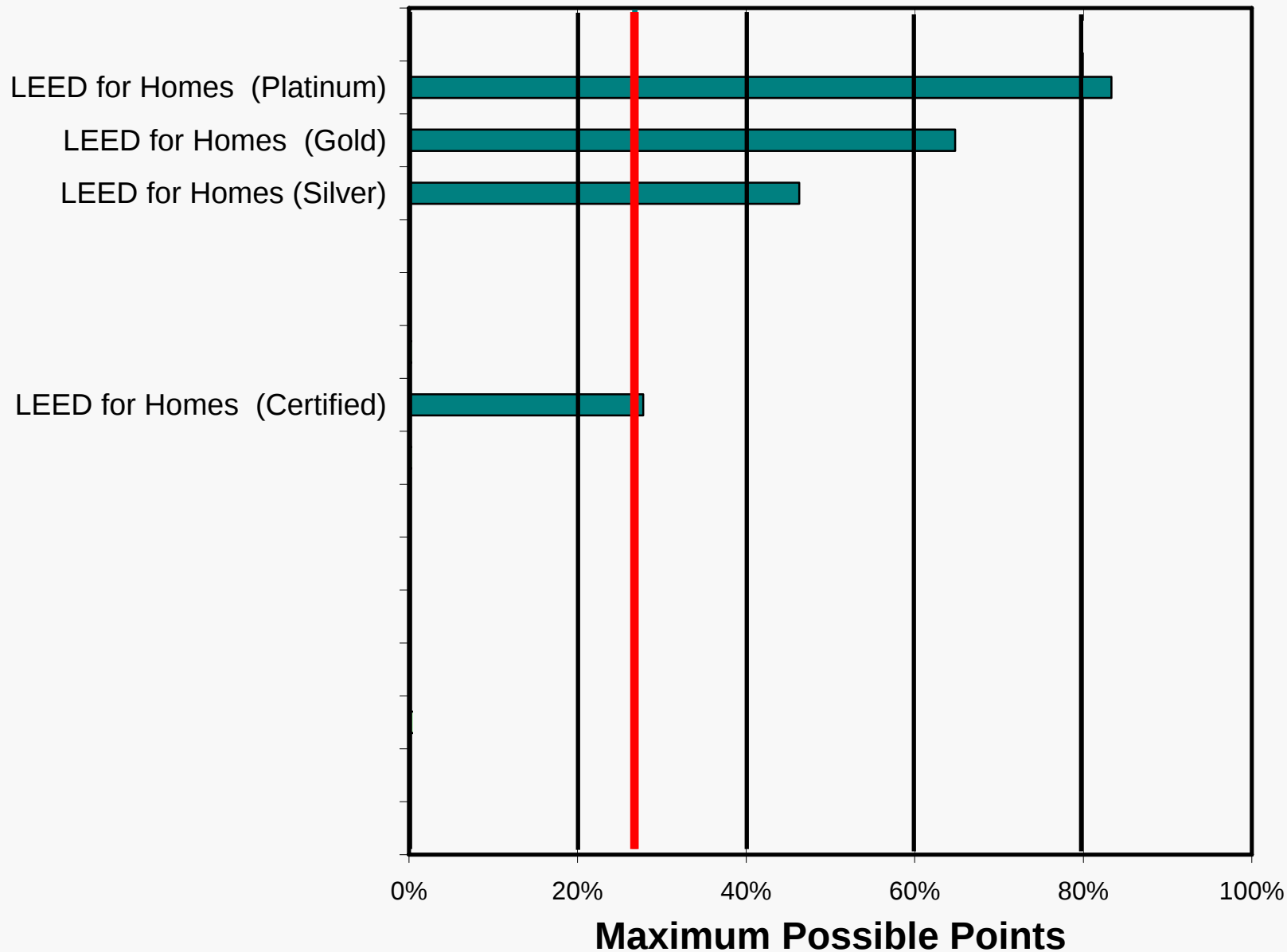


CURRENT SITUATION

More than 50 Existing Green Building Programs

	<u>Average</u>	<u>Max / Min</u>
Checklist length (pages)	7	10 / 5

Relative Performance of GHB Programs



Pilot Version of LEED for Homes Rating System



market rate



LEED
for HOMES

Checklist

LEED for HOMES		Project Checklist		(Version 1.71 - August 2, 2009)	
Builder Name:		Maximum Points			
Address (Street/City/State):		Dry		Normal Wet	
1 Location and Linkages		OR 10			
1.1 LEED-ND Neighborhood		LL2-5 10			
2 Site Selection		LL1 2			
3.1 Infrastructure		LL1 1			
3.2 Site within 1/2 Mile of Existing Water, Sewer, and Roads		LL1 1			
3.3 Select an Infill Site		LL1 1			
4.1 Community Resources		LL1 1			
4.2 Within 1/4 mile of Basic Community Resources / Public Transportation		LL1 2			
4.3 AND/OR Within 1/2 Mile of Green Spaces		LL1 1			
5 Compact Development		LL1 1			
5.1 Average Housing Density ≥ 7 Units / Acre		LL1 1			
5.2 OR Average Housing Density ≥ 10 Units / Acre		LL1 2			
5.3 OR Average Housing Density ≥ 20 Units / Acre		LL1 3			
Sub-Total					
Sustainable Sites		14			
1.1 Site Stewardship		Required			
1.2 Minimize Disturbed Area of Site (If Site > 1/3 Acre)		Required			
2.1 Landscaping		Required			
2.2 Basic Landscaping Design		Required			
2.3 Shading		Required			
2.4 Surface V		Required			
3.1 Non-Tox		Required			
Sub-Total					
Water Efficient		10			
1.1 Water Re		Required			
1.2 Irrigation		Required			
2.1 Indoor W		Required			
2.2 Sub-Total					
Indoor Environmental Quality		10			
1 ENERGY		Required			
2.1 Combust		Required			
2.2 Humidity Control		Required			
3.1 Outdoor Air Ventilation		Required			
3.2 Local Exhaust		Required			
3.3 Supply Air Distribution		Required			
3.4 Supply Air Filtering		Required			
3.5 Contaminant Control		Required			
3.6 Radon Protection		Required			
3.7 Vehicle Emissions Protection		Required			
Sub-Total					
Energy & Atmosphere		10			
1.1 Washer (MEF > 1.8, AND WF < 5.5)		Required			
1.2 Generation System (1 Point / 10% Annual Load Reduction)		Required			
1.3 Emission and Global Warming Contributions		Required			
2.1 Walkthrough of LEED Home		Required			
2.2 LEED's Manual and Multiple Walkthroughs / Trainings		Required			
3.1 Ind Justification for Specific Measure		Required			
3.2 Ind Justification for Specific Measure		Required			
3.3 Ind Justification for Specific Measure		Required			
3.4 Ind Justification for Specific Measure		Required			
Sub-Total					
Materials & Resources		10			
1.1 points Platinum 90-108 points		Required			
1.2 ches / year; Normal (20-40 inches / year); and Wet (> 40 inches / year)		Required			
2.1 above as installed in the home identified above.		Required			
2.2 Company		Required			
2.3 Date		Required			
3.1 I hereby attest that I have reviewed the verification information, and certify that this home meets the requirements of LEED for Homes		Required			
3.2 Provider's Name		Required			
3.3 Signature		Required			
3.4 Company		Required			
3.5 Date		Required			

Simple

- ❖ 1 page (both sides)
- ❖ 100 points
- ❖ Entry level = 30 pts.



LEED for HOMES

Rating System

www.usgbc.org/leed/homes

**Rating System
For Pilot Demonstration of
LEED® for Homes Program**

US Green Building Council

August 5, 2005



LEED
for **HOMES**

Purpose of Pilot

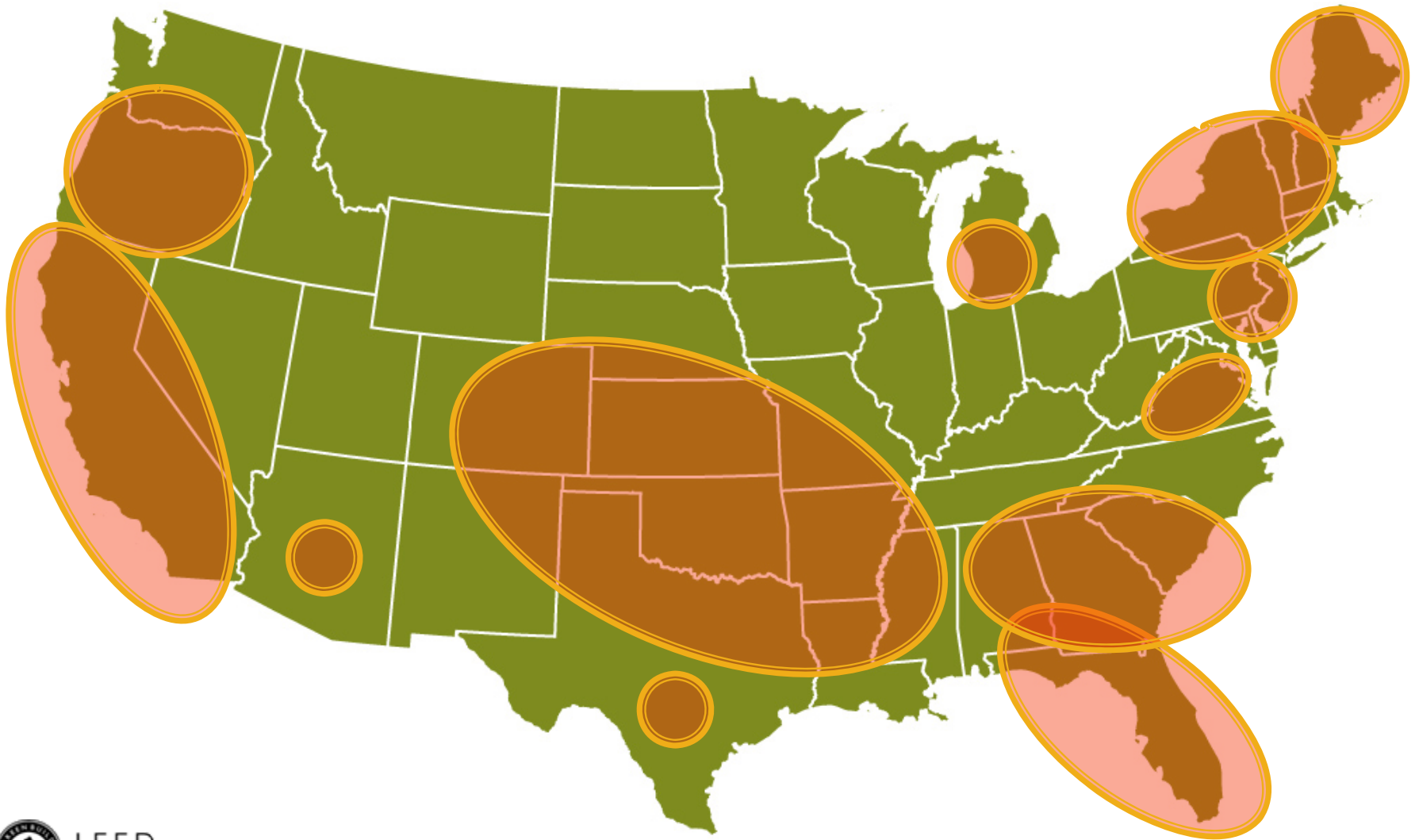
USGBC (To Listen, Learn, and Support)

1. Ease of Use of Rating System
2. Ease of Delivery
3. Stakeholder Acceptance



LEED
for **HOMES**

PILOT MARKETS



Pilot Schedule

Key Activities	Schedule									
	Pilot Phase									
	Sept	Oct	Nov	Dec	Jan '06	Feb	March	Apr	May	
TAG/SC Approval										
Local Orientation Meetings										
Builder Recruiting										
Preliminary Ratings										
Build LEED Homes										
LEED Certifications										
1st Public Review										
2nd Public Review										
USGBC Ballot										
Fully Chartered Program										

Pilot Status

Type of Participant	Registered
# of Providers	11
# of Builders	80
# of Homes	
Single Family	100
Multi-Family	200



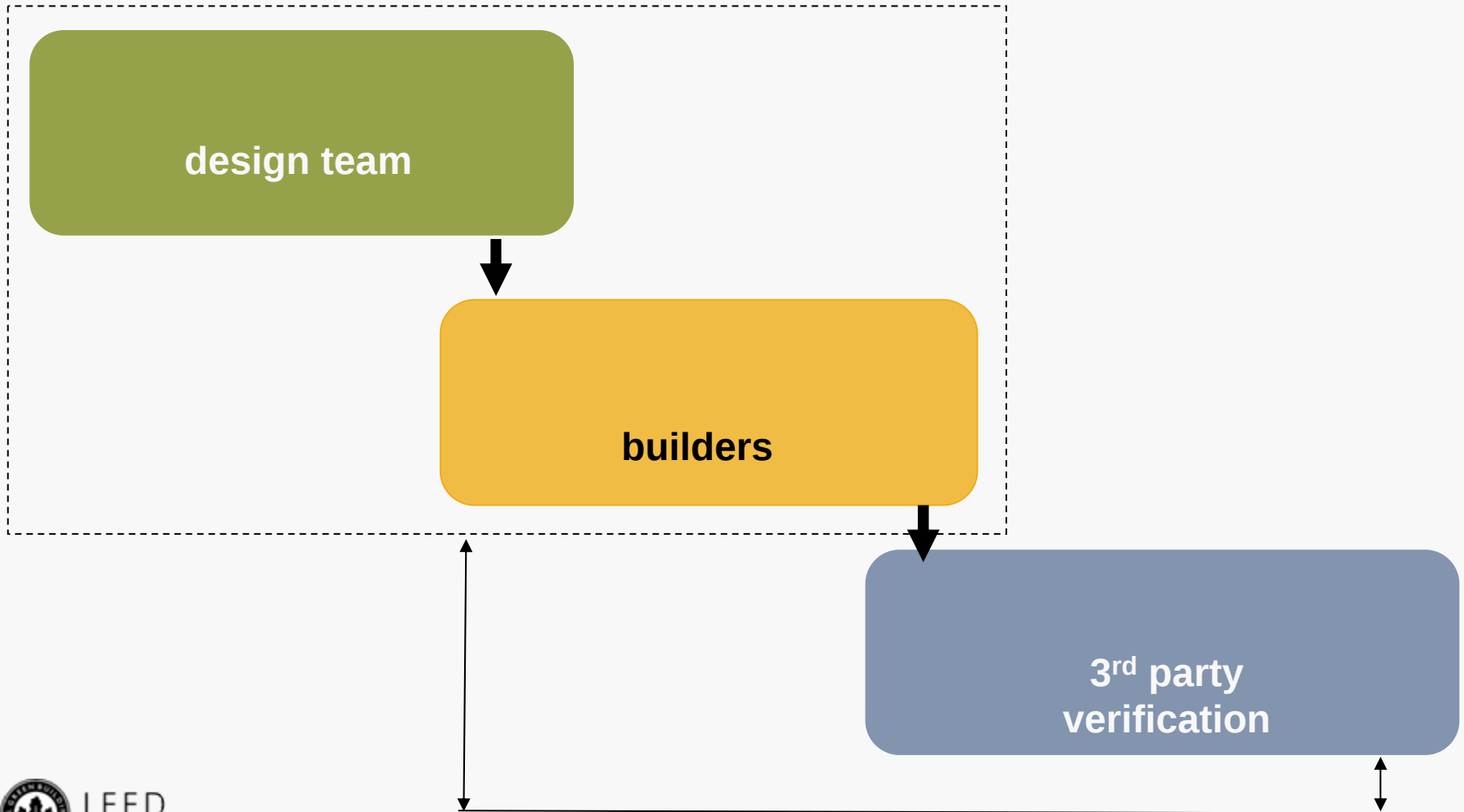
LEED
for **HOMES**

Challenges and Opportunities



LEED
for HOMES

Roles of Key Stakeholders



Mandatory Measures

ENERGY STAR Labeled Home

Health and Safety Measures

Combustion Venting

Controlled Ventilation

Durability Plan

Waste Management Plan

Site Protections

Owner's Manual



What's New?

Regional Applicability
Climate Zones
Precipitation Zones

Durability
Plan
Inspection

Home Size

Location and Linkages
LEED-ND

Landscaping and Irrigation



LEED for Homes Verification Process



LEED
for HOMES



Roadmap

The Basic Steps
(Approx 5-8 Months)

**Builder's
Responsibilities**

**Provider's
Responsibilities**

**USGBC's
Responsibilities**

**Step 1:
Join
LEED for Homes**

**Step 2:
Select
Green Features**

**Step 3:
Build
LEED Homes**

**Step 4:
Certify as
LEED Homes**

**Step 5:
Sell
LEED Homes**

Performance Tests

List of Special Measures		Resp.	Performance Level	
Category	Credit		Mandatory	Optional
Energy	1. ENERGY STAR Home	Rater	☒	
	3. Envelope Air Leakage	Rater	☒	
	5. Duct Leakage	Rater	☒	
	6. Refrigerant Charge	HVAC	☒	

Anticipated Effort for Verification

Type of Verification Activity	No. of Hours Required	
	ENERGY STAR	
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	

Provider's POV



LEED
for HOMES

Next Steps

In 2006

- ☐ Current Providers will Expand their Reach
- ☐ Affordable and Multifamily Homes
- ☐ Pilot LEED for Homes Trainings
- ☐ Pilot Marketing Tools
- ☐ Revisions, as needed
- ☐ Public Comment Period

In Early 2007

- ☐ Expand Program to Include New Providers



Why LEED for Homes?

- ❑ **Simple** - to understand and implement
- ❑ **Substantive** - to differentiate top 25% of homes
- ❑ **Compelling** - nationally recognized LEED brand
- ❑ **Affordable** - net cost of less than \$1 / day
- ❑ **Credible** - based on consensus of GHB experts
- ❑ **Market Based** - build on success of existing GHB Programs, ENERGY STAR, and HERS



LEED
for **HOMES**

Key Contacts

US Green Building Council Staff

Administrative and Technical Questions

Jay Hall, Acting Program Manager

410 263-3162 jayh@buildingknowledge.net

Affordable Homes Questions

Emily Mitchell, Program Assistant

202 587-7187 emitchell@usgbc.org

LEED for Homes Committee Co-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



LEED
for **HOMES**

**build green,
everyone profits.**