2009 LEED Update

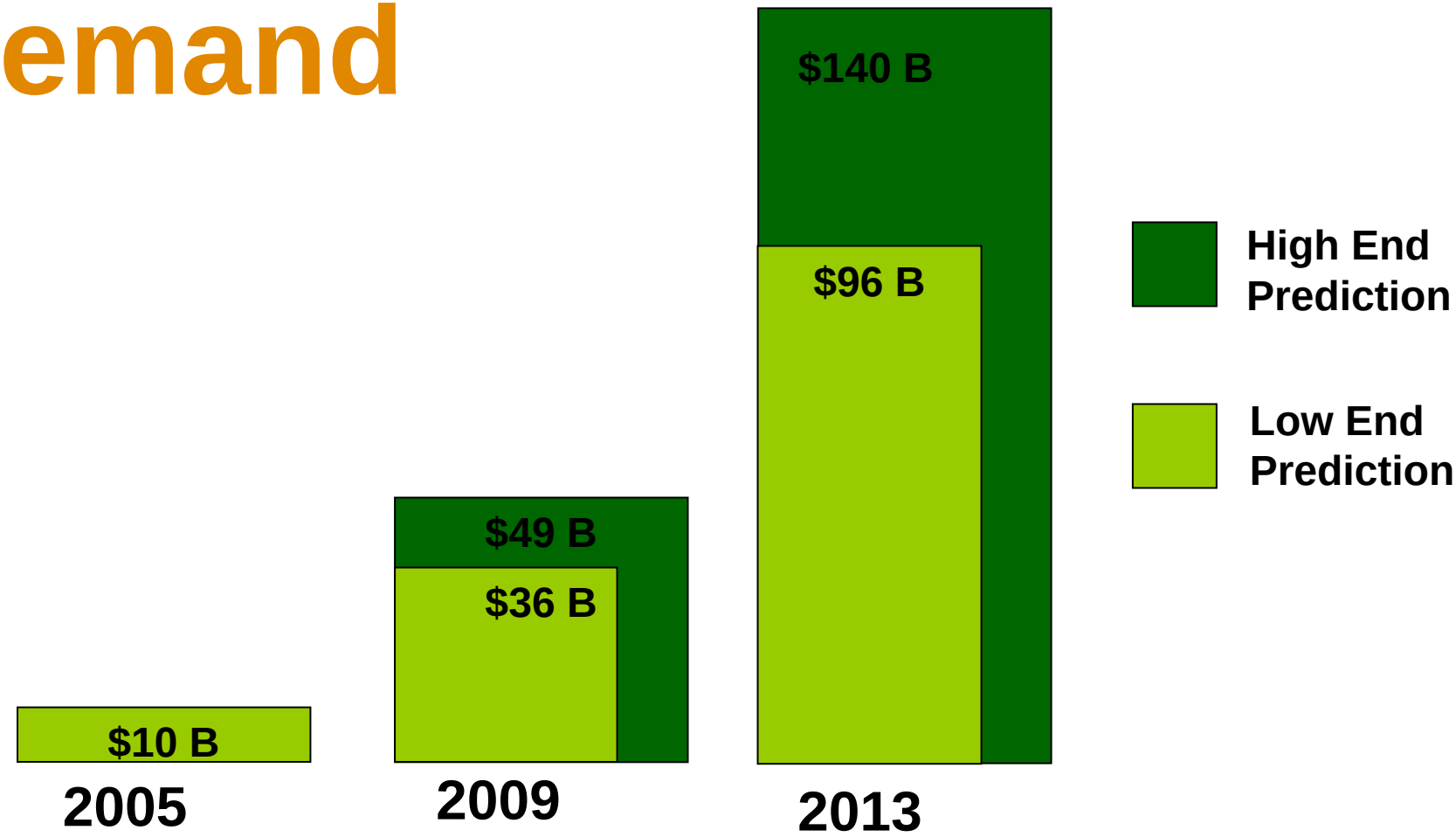
Sean McGuire, Plumbing Contractors of America
Sarah Balz, Affiliated Engineers, Inc.

Session Overview

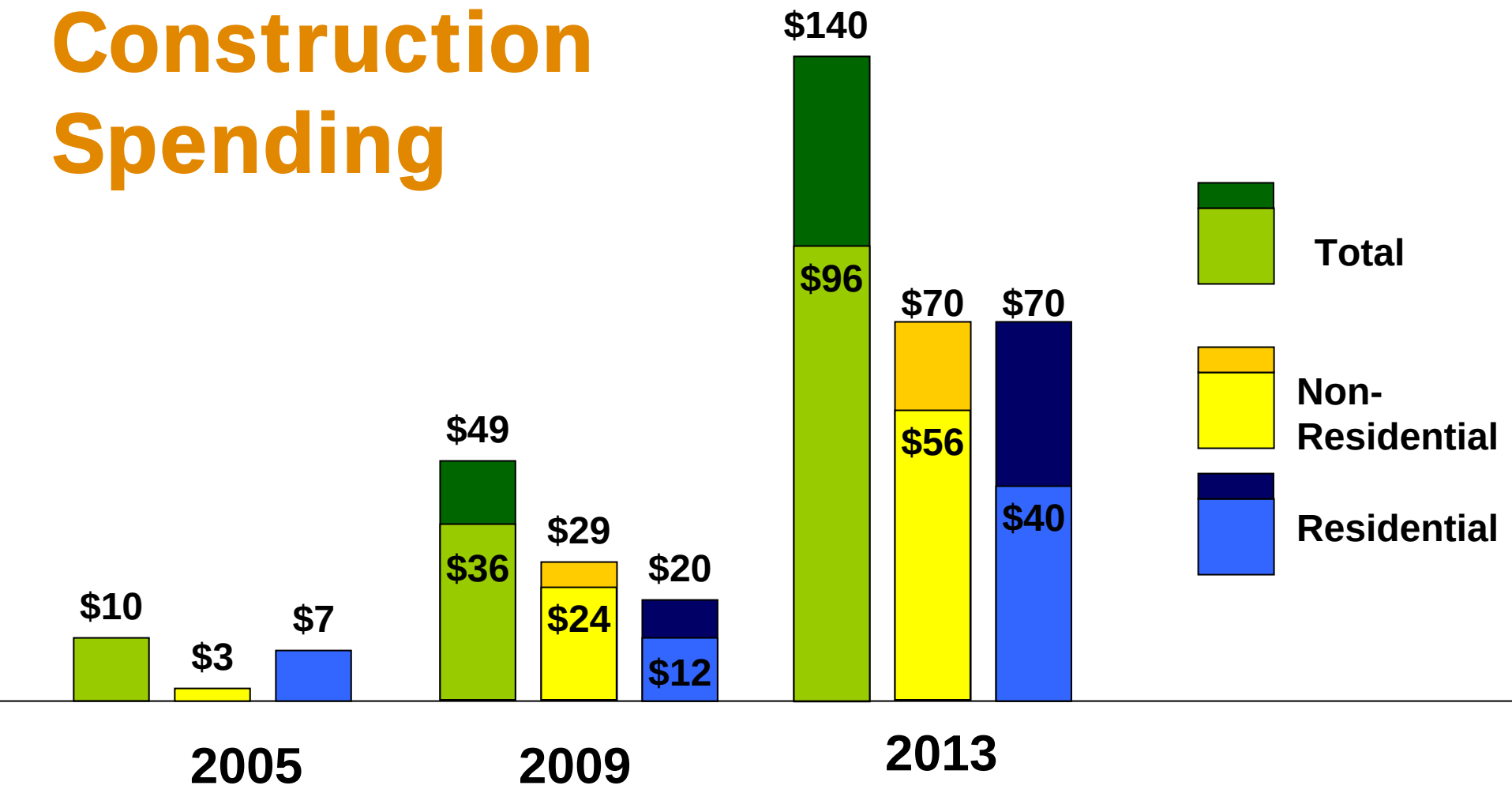
- Green Building Demand
- Formation of the Green Building Certification Institute (GBCI)
- LEED AP Update
- LEED v3 Major Update
- Point-by-point breakdown of 2009 Changes

Plumbing Contractors of America
PCA

Green Building Demand

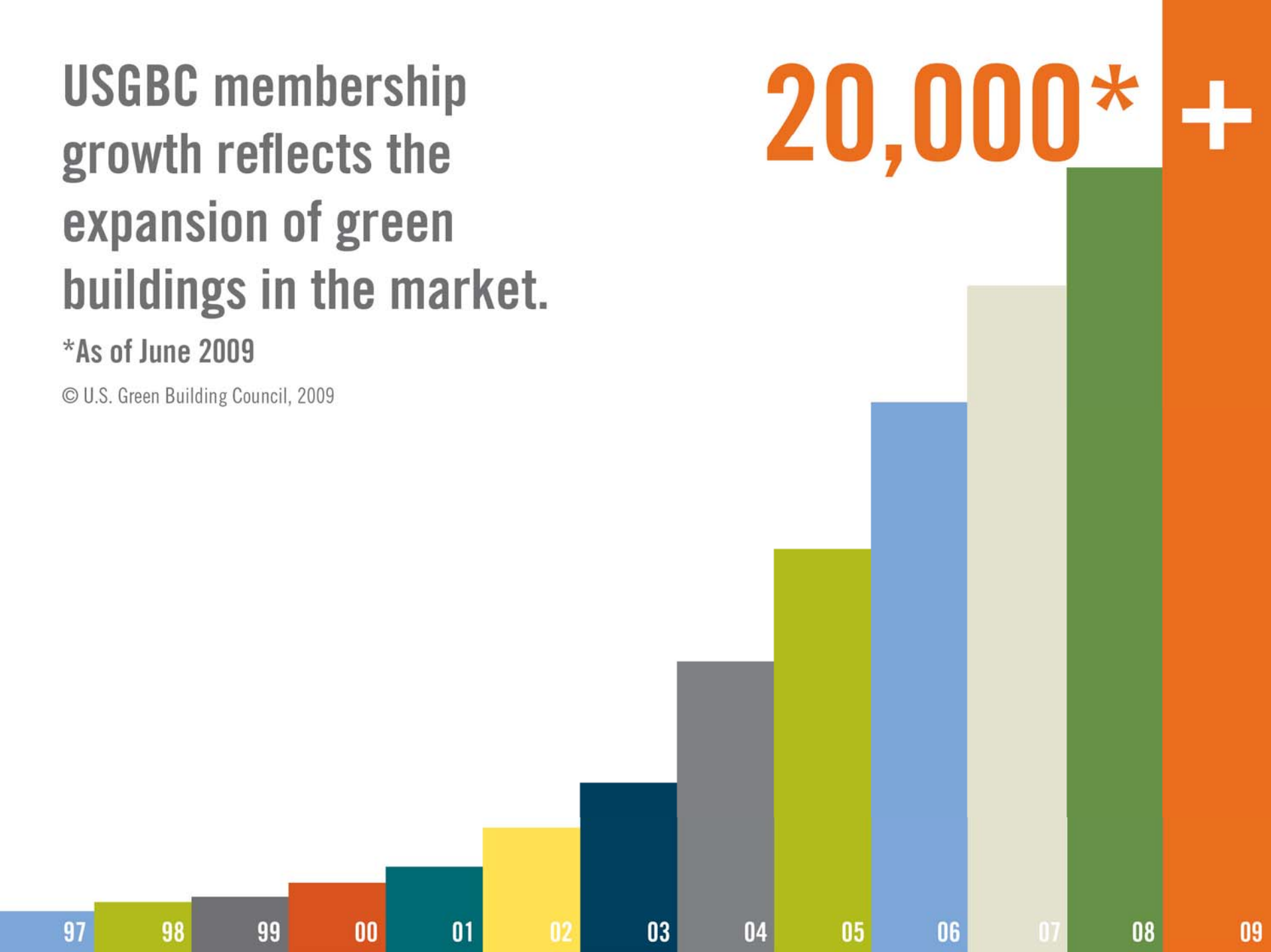


Non Residential and Residential Green Construction Spending



USGBC membership growth reflects the expansion of green buildings in the market.

*As of June 2009



GBCI

GREEN BUILDING CERTIFICATION INSTITUTE

HEREBY CERTIFIES THAT

114,291*

HAS ACHIEVED THE DESIGNATION OF

LEED® ACCREDITED PROFESSIONAL

BY DEMONSTRATING THE KNOWLEDGE OF GREEN BUILDING PRACTICE REQUIRED FOR SUCCESSFUL IMPLEMENTATION OF THE LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED®) GREEN BUILDING RATING SYSTEM™.

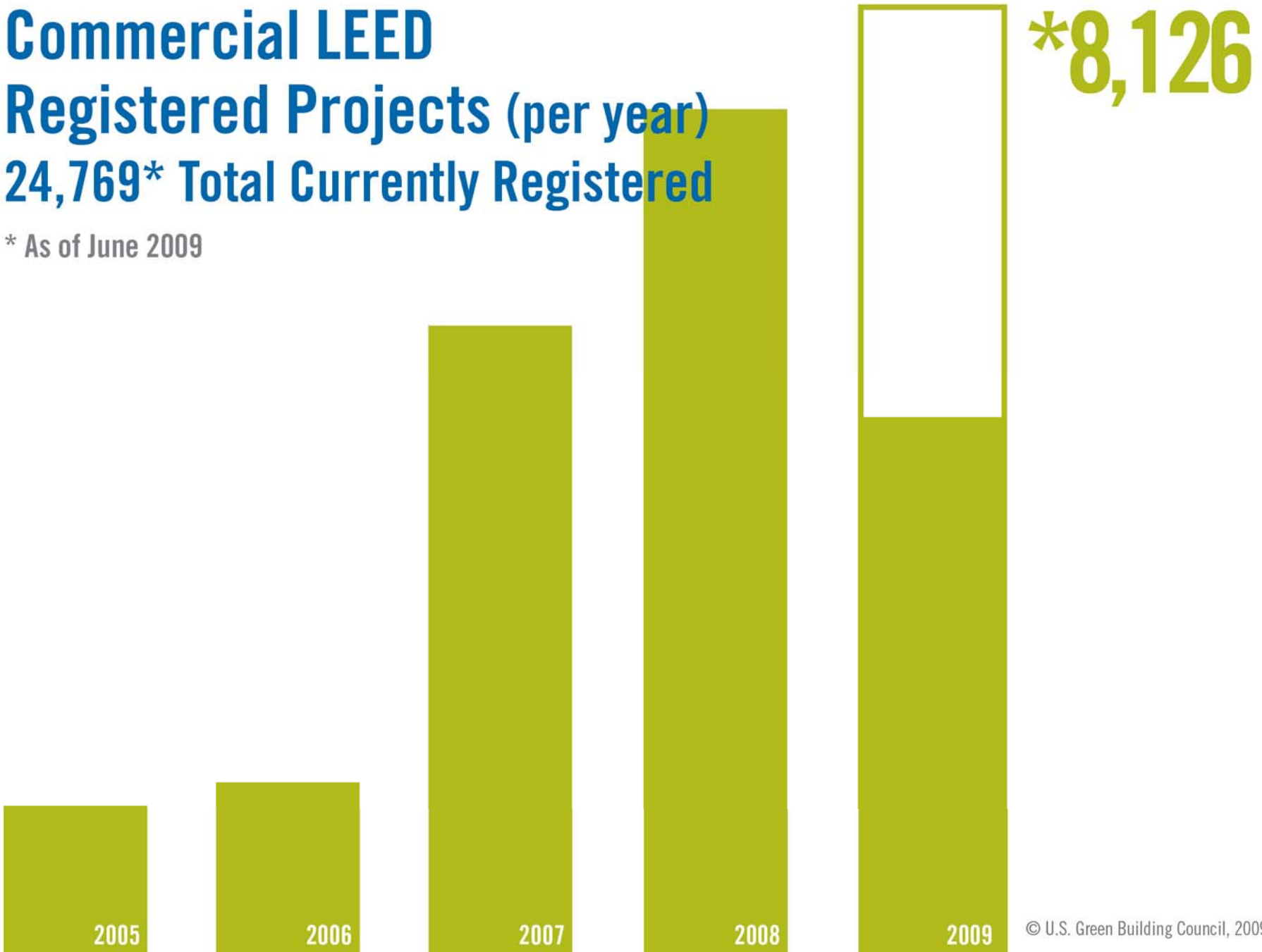
LEED AP™

*As of June 2009

Commercial LEED Registered Projects (per year)

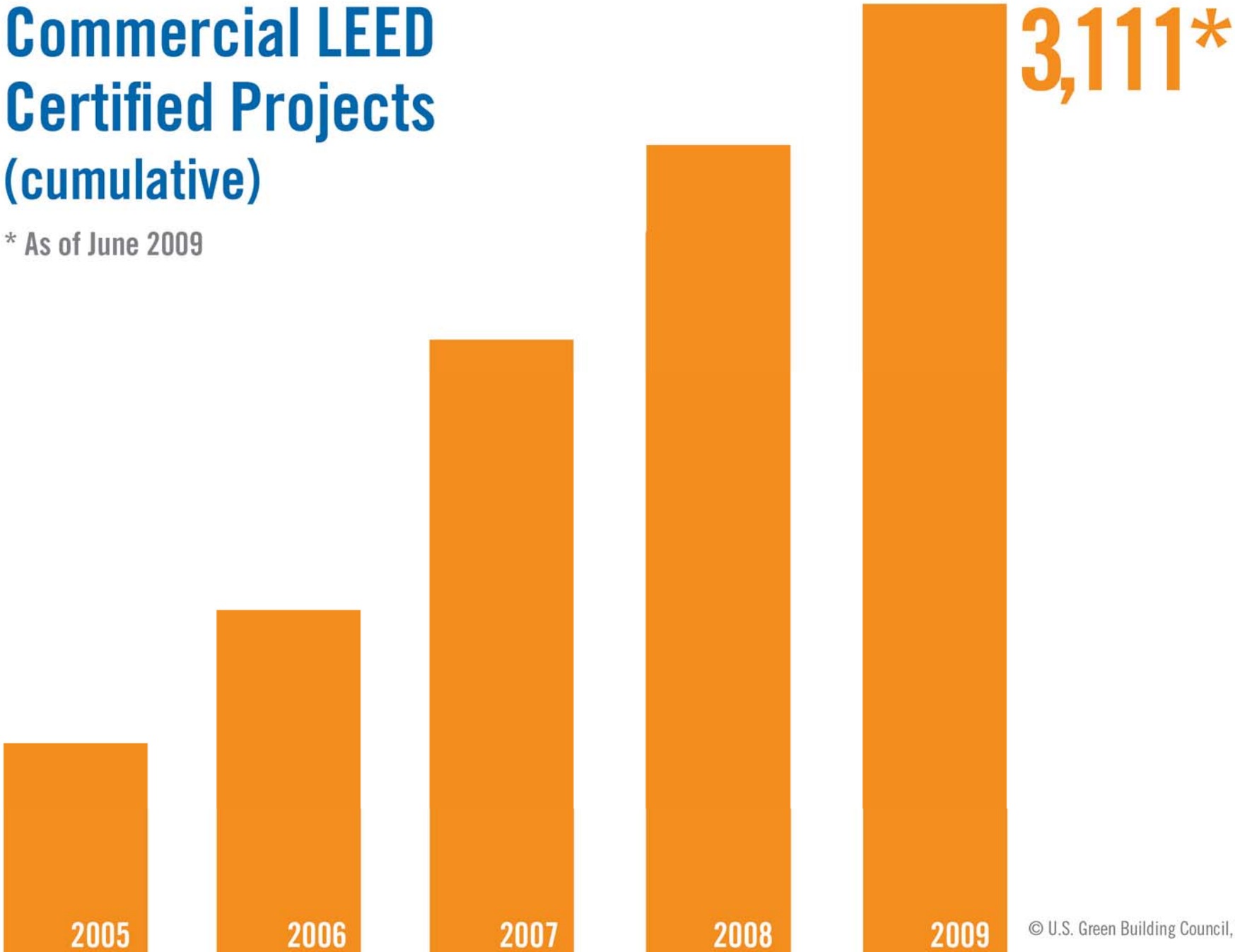
24,769* Total Currently Registered

* As of June 2009



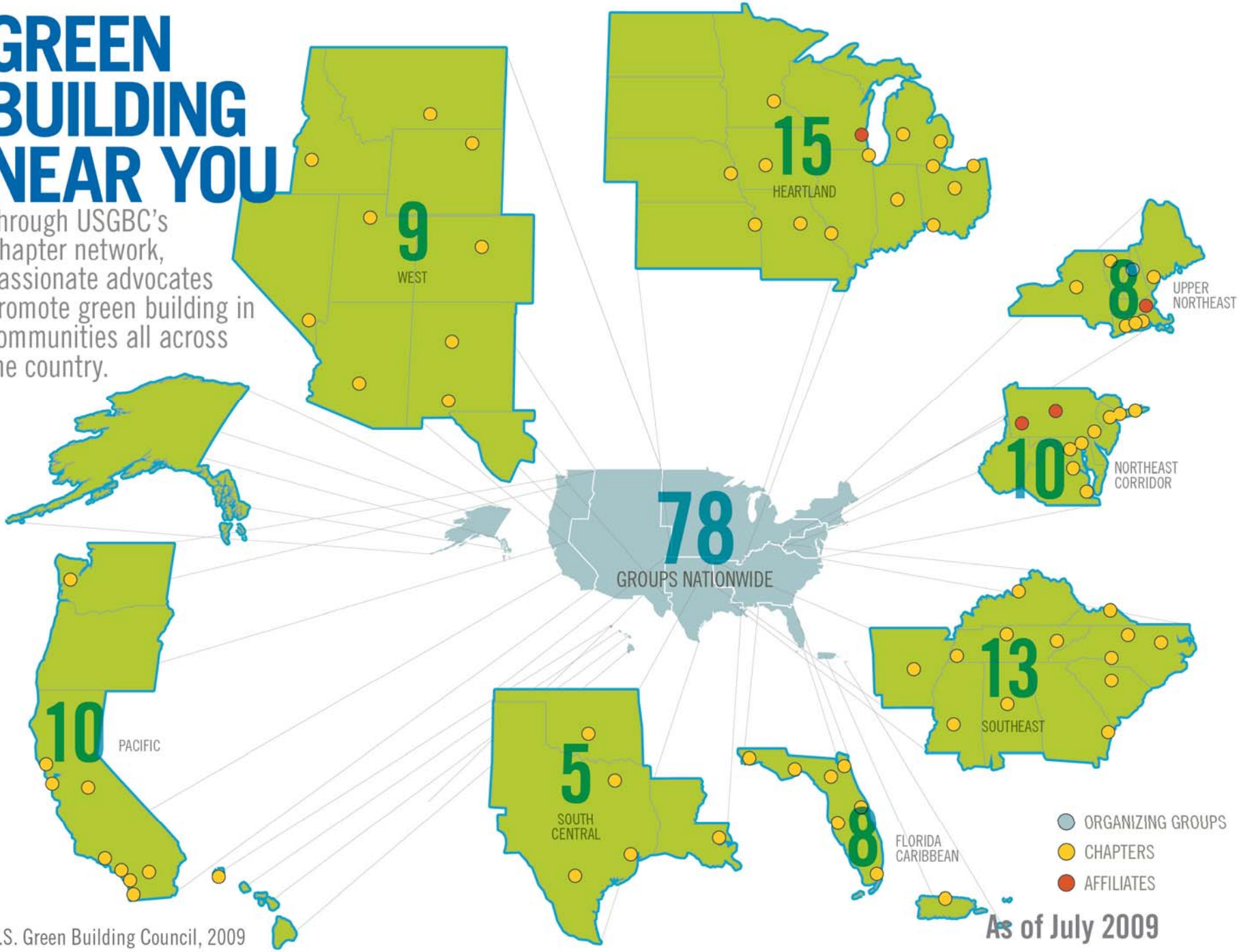
Commercial LEED Certified Projects (cumulative)

* As of June 2009



GREEN BUILDING NEAR YOU

Through USGBC's Chapter network, passionate advocates promote green building in communities all across the country.



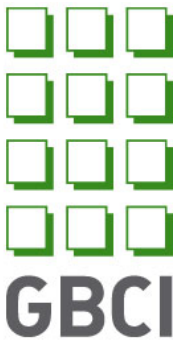
As of July 2009

LEED Accreditation

Plumbing Contractors of America

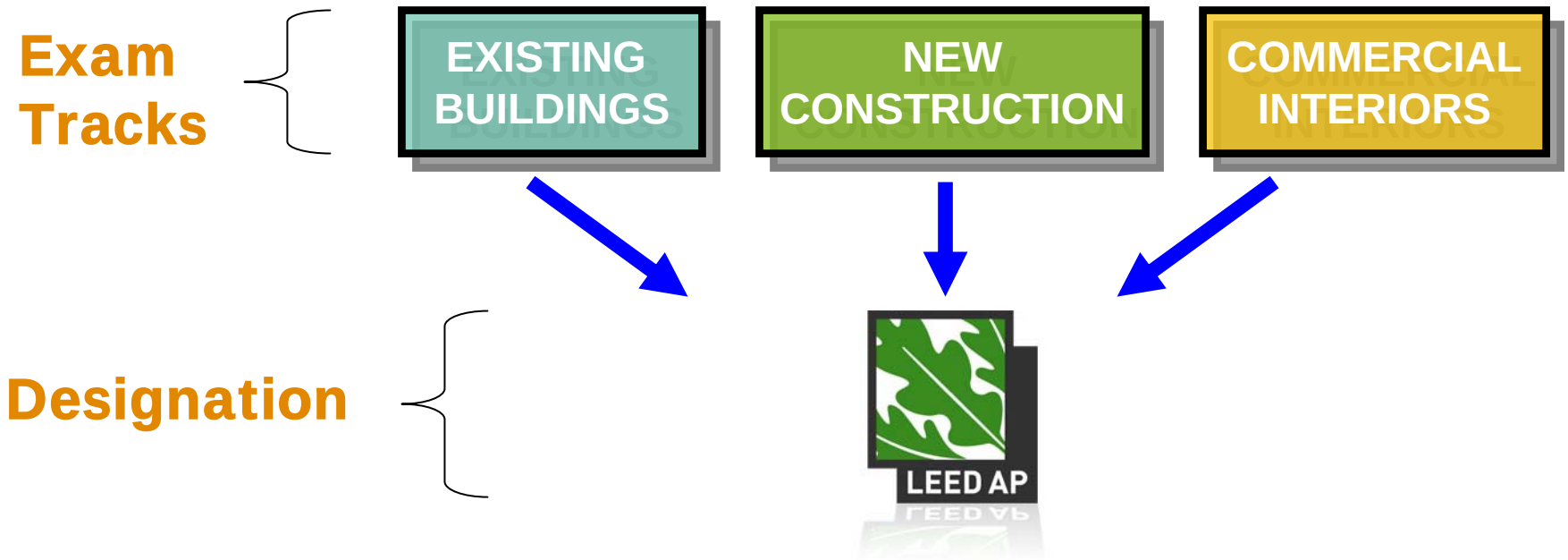
PCA

LEED Accreditation



LEED Accredited Professionals

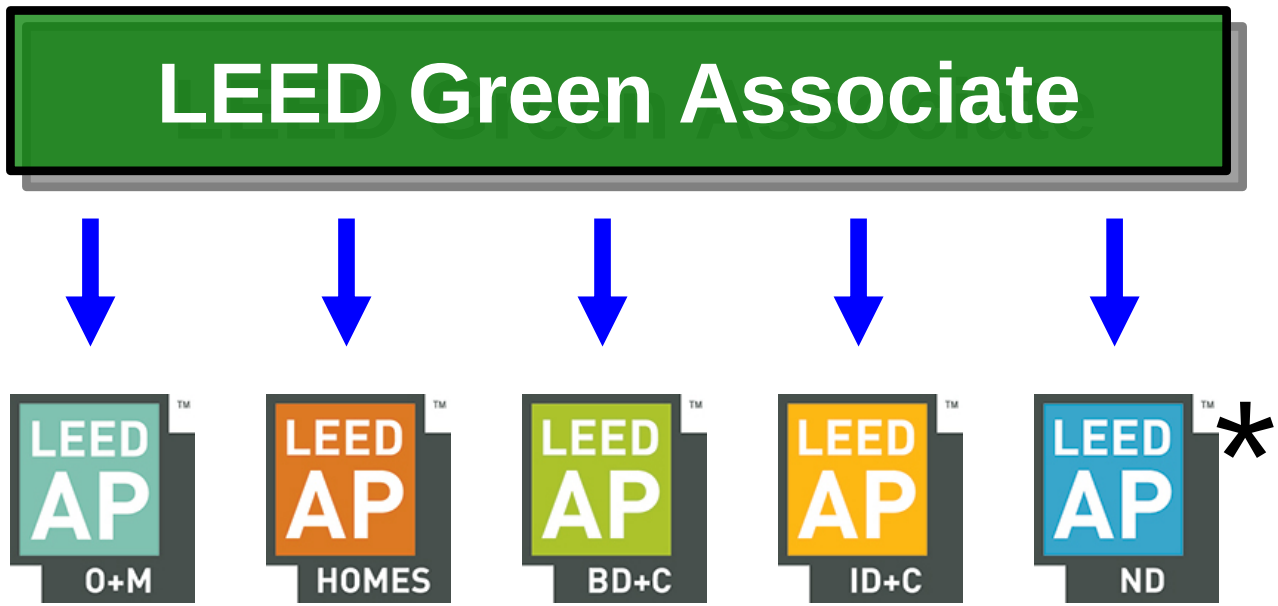
Testing Format
2001-May 2009



LEED Accredited Professionals

Current Testing Format

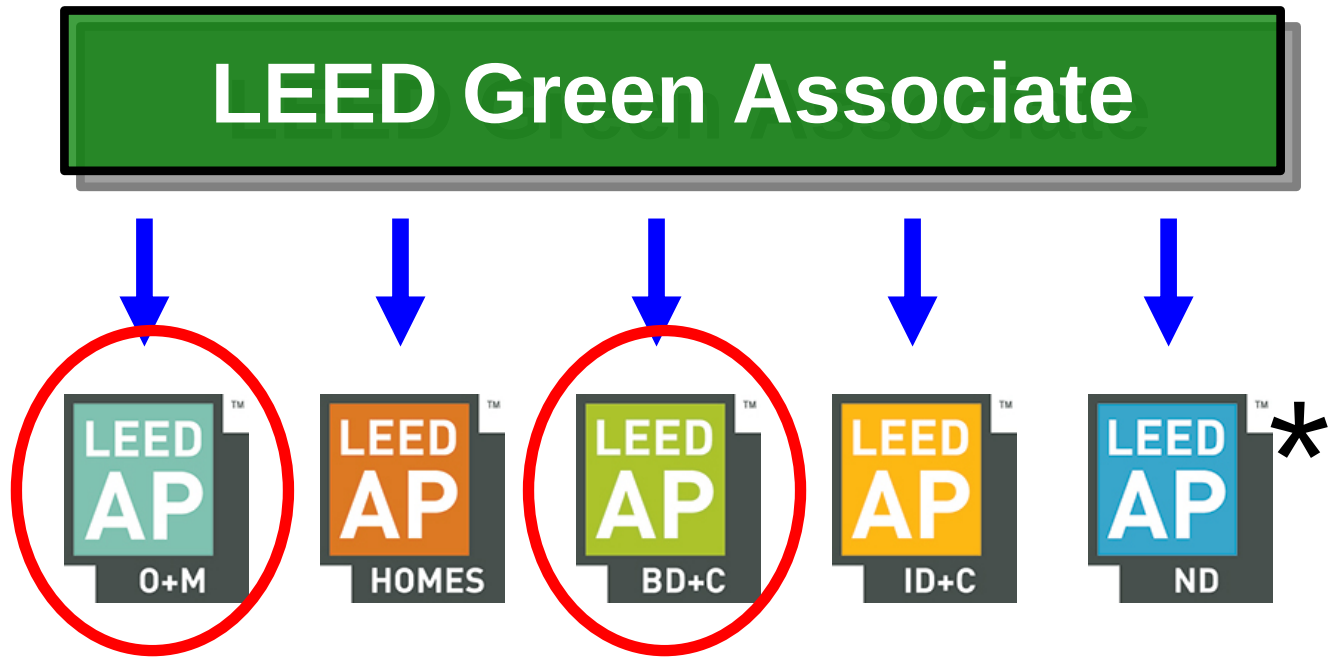
LEED Green Associate

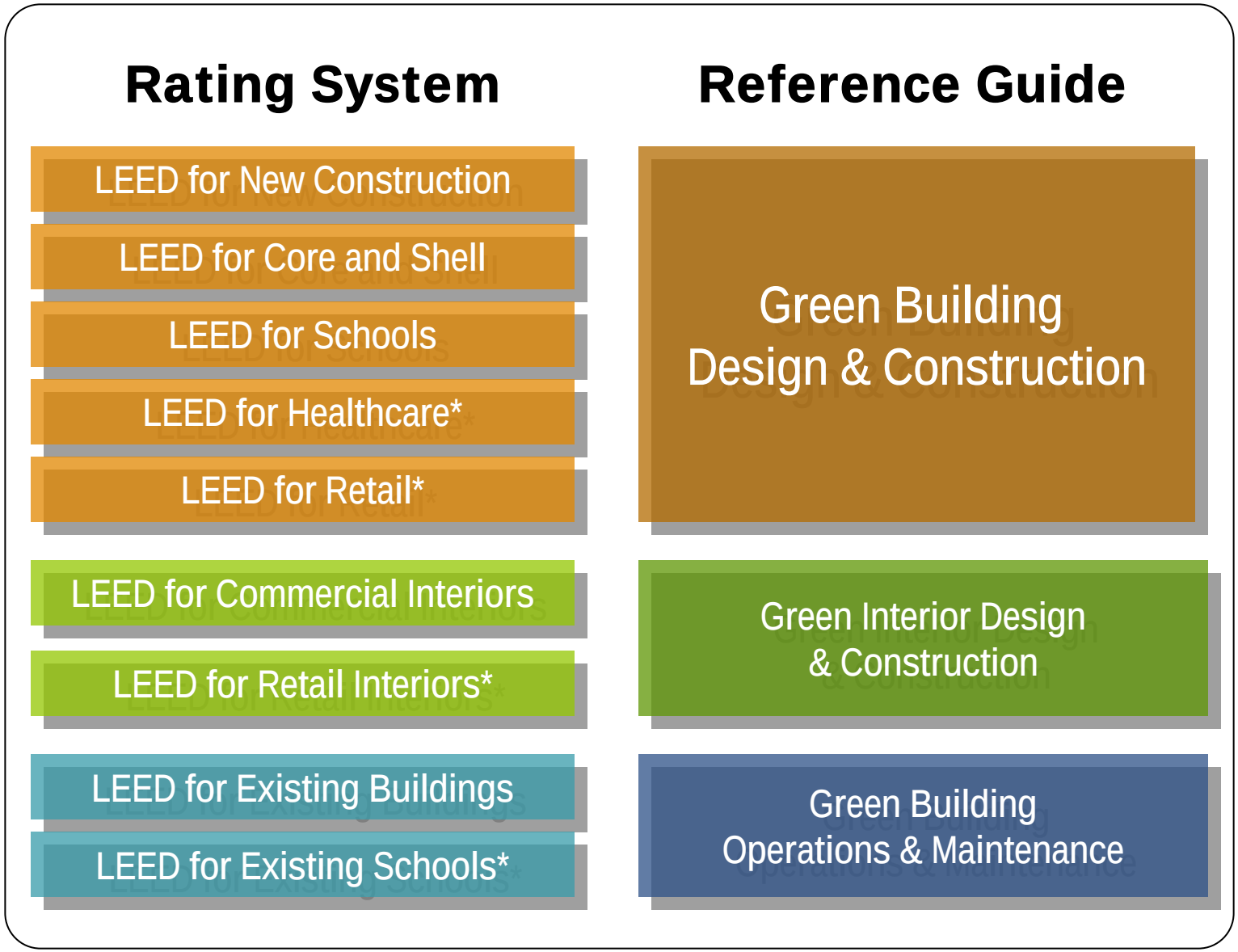


LEED Accredited Professionals

Current Testing Format

LEED Green Associate





* These rating systems are under development or in pilot

Plumbing Contractors or Engineers

- LEED for New Construction
- LEED for Core and Shell
- LEED for Schools
- LEED for Healthcare*
- LEED for Retail*

Green Building
Design & Construction

Design or Construction for Existing Buildings

- LEED for Existing Buildings
- LEED for Existing Schools*

Green Building
Operations & Maintenance

* These rating systems are under development or in pilot

LEED AP Exam Fees

$100	
Member	Non Member

Application

$150	$200

LEED Green Associate

$150	$250
$300	$450

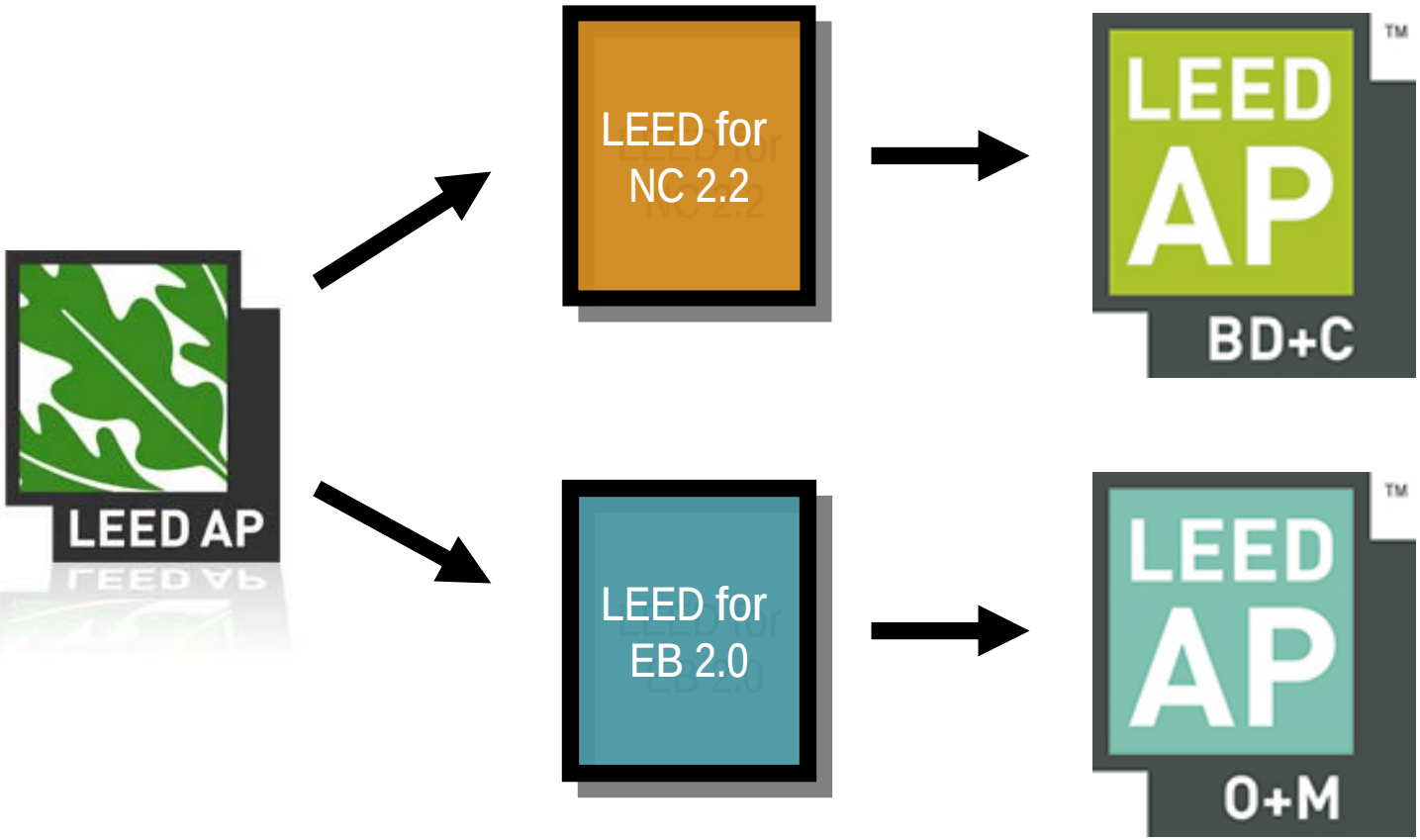
$50 / 2 Years

Credential Maintenance

Current LEED Accredited Professionals

- YOU DO NOT HAVE TO RETAKE AN EXAM
- Acceptance Disciplinary Policy
- Agreement to Credential Maintenance Program
  - $50 Fee waived first time
  - Continuing Education Hours
- Enroll by June, 2011
- Need to Identify Specialty

Current LEED Accredited Professionals



Credential Maintenance

- $50 Credential Maintenance Fee
- Have to sign Disciplinary Policy
  - Allows the USGBC to suspend or revoke LEED AP
  - Allows for anonymous reporting of offenders
- 15 Hours every two years for LEED GA
- 30 Hours every two years for LEED AP
- Acceptance of AIA and PE Hours
- 6 Hours have to be LEED Specific

Credential Maintenance

LEED Specific Hours

LEED Green Awareness
- 15 Total Hours
- 3 LEED Specific Hours

LEED Accredited Professionals
- 30 Total Hours
- 6 LEED Specific Hours

Credential Maintenance

LEED Specific Hours

- For LEED AP's, must be within your specialty

- Must be performed by a USGBC Certified Education Provider
  - Look up in the Education Provider Directory
  - PCA working to establish these

Credential Maintenance

Accruing Credit Hours

1. Professional Development Courses
2. Live Presentations
3. Self Study Programs
4. College and University Courses
5. Certificates, Professional Licenses and Credentials
6. Committee and Volunteer Work
7. Authorship
8. LEED Project Preparation

- Last Resort – Re-test

Accruing Credit Hours

Education Reviewing Bodies

- Organizations that Approve & Review Professional Development Courses.

- Not required to submit for CE hours for
  - Live Presentations
  - Self-study Programs
  - College & University Courses

- Required for all Professional Development/Continuing Education

Credential Maintenance

Education Reviewing Bodies

1. Professional Development Courses
2. Live Presentations
3. Self Study Programs
4. College and University Courses
5. Certificates, Professional Licenses and Credentials
6. Committee and Volunteer Work
7. Authorship
8. LEED Project Preparation

Credential Maintenance

Professional Development Courses / Continuing Ed.

- Workshops
- Career Training
- Can be offered by a University or Association

- MUST BE ERB Approved!!!

Credential Maintenance

Live Presentations

- This Symposium
  - Unfortunately, not this session.
- Does not have to be ERB approved, but can.
- Courses that count at this Symposium
  - Rainwater Harvest Systems
  - Solar Domestic Water Systems
  - Making Sewage Sanitary
  - International Water Efficiency
- Includes Instructor Hours

Credential Maintenance

Self Study Programs

- Webinars
- Audio Courses/Podcasts
- Reading professional manuals, publications and articles
- Online Examination

- CANNOT EXCEED 5 HOURS of TOTAL CE

Credential Maintenance

College & University Courses

- Includes Community Colleges
- 1 CE for every Classroom hour
- 3 credit course equates to 35 CE hours
- Course must be at an accredited college or University
- Has to be on one of the approved topics
- No limit to CE hours

Credential Maintenance

Certificates, Professional Licenses and Credentials

- Completing the examinations for certificates, professional licenses or credentials
- Not applicable to LEED specific hours
- 1 CE for certificates
- 3 CE for professional licenses and credentials
- Does not count for past achievements
  - Must have passed in this reporting period

Credential Maintenance

Certificates, Professional Licenses and Credentials

Approved Certificates (1 CE)

- OSHA Construction Safety & Health Specialist
- Green Advantage Certification
- CSI Certified Construction Specifier (CCS)

Approved Licenses (3 CE)

- National, state or provincial licensing exam in a field related to or supporting Green Building.

Credential Maintenance

Certificates, Professional Licenses and Credentials

Approved Professional Credentials (3 CE)

- Professional Engineer's Exam
- American Institute of Constructors
  - Associate Constructor Exam
- Construction Management Association of America
  - Certified Construction Manager
- Professional Home Inspectors Exam

Credential Maintenance

Committee & Volunteer Work

- For USGBC and GBCI Participation ONLY
- Includes Local Chapters
- 2 CE for holding a leadership position
- 0.5 CE for attending each meeting
  - Must have meeting minutes kept
- Total may not exceed 4 CE per period

Credential Maintenance

Authorship

- Published articles and books that are related to approved education topics.
- 3 hours per article
- 10 hours per book
- Volunteers? PCA willing to publish.
- Must be published in the reporting period
- All articles and books are automatically audited

Credential Maintenance

LEED Project Participation

- Verified through
  - LEED Online Process
  - Project manager
  - Employer/Client Attestation
- 1 CE per LEED Credit
- 2 CE for being Project Administrator
- Maximum of 10 CE per reporting period
- ALL HOURS ARE LEED SPECIFIC
- You do not have to earn the credit to earn CE
- Project has to only be **registered**, not certified.

Credential Maintenance

LEED Project Participation

Examples:

- Plumbing Engineer performs the Water Efficiency calculations for project that attempts three requirements:
  - WE Pre-requisite – Water Use reduction
  - WE 2 – Innovative Wastewater Technologies (failed)
  - WE 3 – Water Use Reduction 40% (4 pts)

- 3 CE earned

Credential Maintenance

BD&C Approved Topics

Water Management

- Water Treatment
- Stormwater
- Specialized Equipment Needs
  - Solar Thermal
  - High Efficiency Toilets
  - Composting Systems

Credential Maintenance

BD&C Approved Topics

Project Systems & Energy Impacts

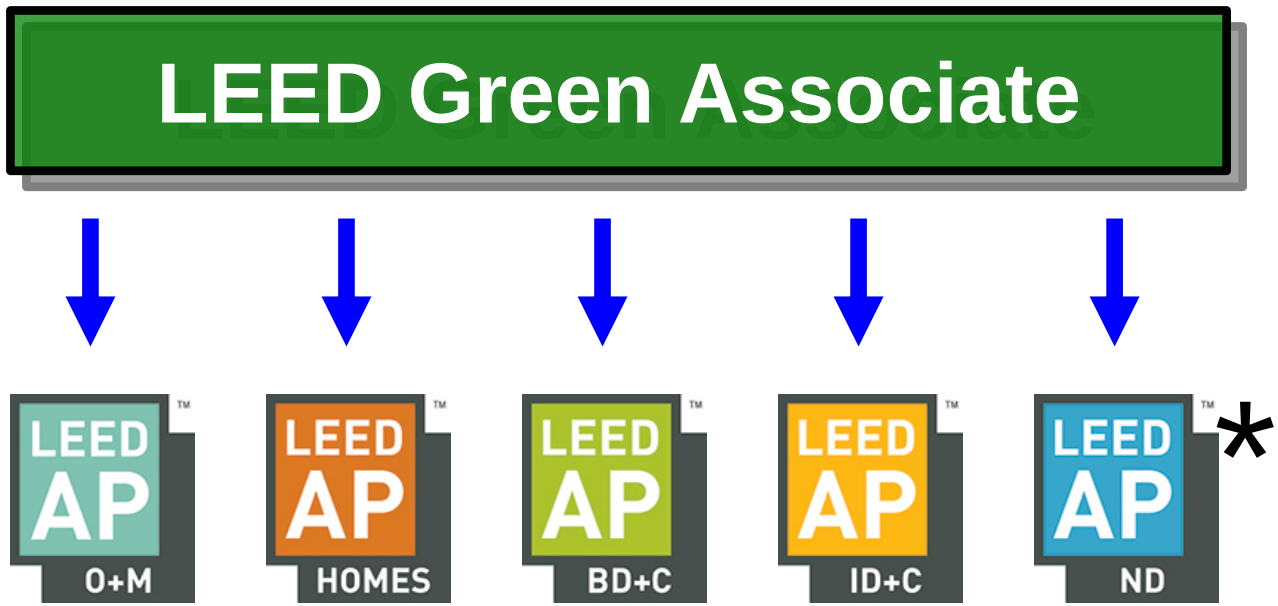
- On-site Renewable Energy
- Energy Performance Management
- Energy Performance Policies
- Sources

Indoor Environment

- Thermal control
- Indoor Air Quality
- Ventilation
- Tobacco Smoke Control

Taking the New Exams

LEED Green Associate



Taking the New Exams

LEED Green Associate

- Application and Exam Fee
- Eligibility Requirements
  - Documented involvement on a LEED project
  - **OR** Employment in a Sustainable Field
  - **OR** Taken an Education Program that addresses Green Building Principles
- 2 ½ Hour Exam
- No Technical Data only general LEED material
- Target candidates are marketing, sales, students and manufacturers

Taking the New Exams

LEED Green Associate

What it covers:

- Overview of rating system.
- Terms (Memorize the Glossary)
- The USGBC and its programs
- What the GBCI does
- Different Rating Systems and their purposes
- Stages in the building process and where LEED comes into play.
- General topics within point categories

Taking the New Exams

LEED Green Associate

Water Efficiency Example

- Baseline vs. Design
- Difference between Flow and Flush Fixtures
- Indoor vs. Outdoor Water Use
- Process Water
- Water Reuse Strategies

Taking the New Exams

- Application and Exam Fee
- Eligibility Requirements
  - Pass the LEED Green Associates Exam
  - Involvement on a LEED project within 3 Years
    - Documented by LEED Online or
    - Letter of Attestation
- 1 ½ Hour Exam
- 20% Pass Rate
- Target candidates are Architects, Engineers & Contractors

Taking the New Exams

Frequently Asked Questions

- How many times can I take the exam?
- Do I get a discount if I have to retake?
- If I pass only one part, what happens?
- How is the exam scored?
- Which exam should I take?

Recommendations

- Don’t Agree to the Credential Maintenance Policy until December
- Take the Exams Separately
- Document LEED experience
  - Get GC’s or LEED Project Admin to write letters of Participation
- Send in more CE than you need
- Register as your given name when testing

LEED v3 Updates

Plumbing Contractors of America
PCA

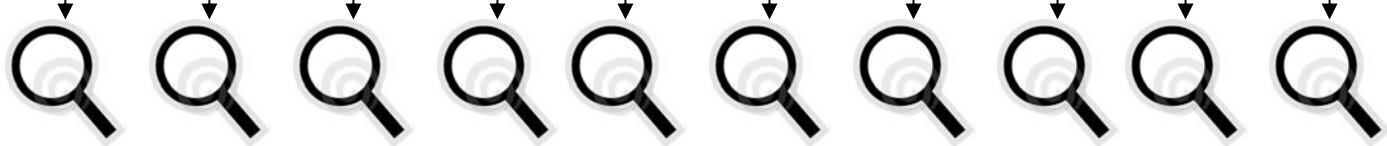
LEED v3 Updates

- Separation of GBCI
- Expanded Third Party Review
- Harmonization
- Predictability
- Weightings
- Regional Credits

LEED v3 Updates

Expanded Third Party Review

LEED Online Project

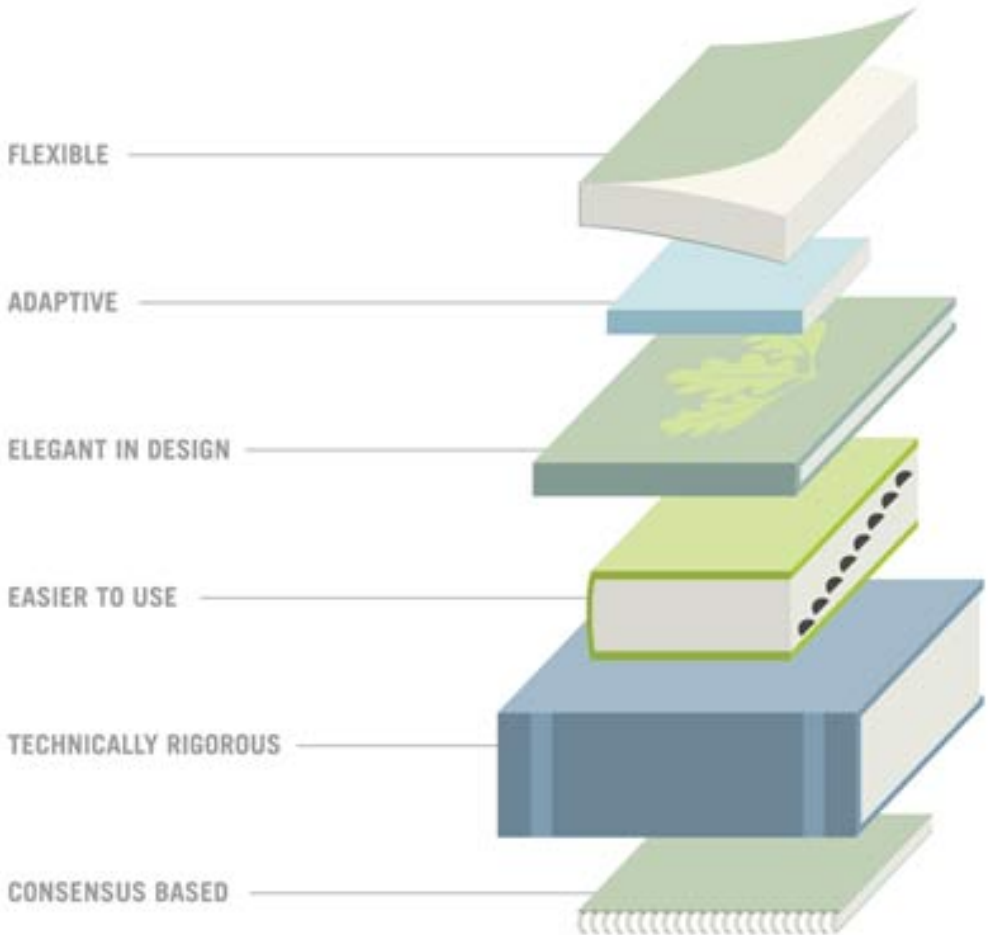


Certification Bodies

ISO International Organization for Standardization

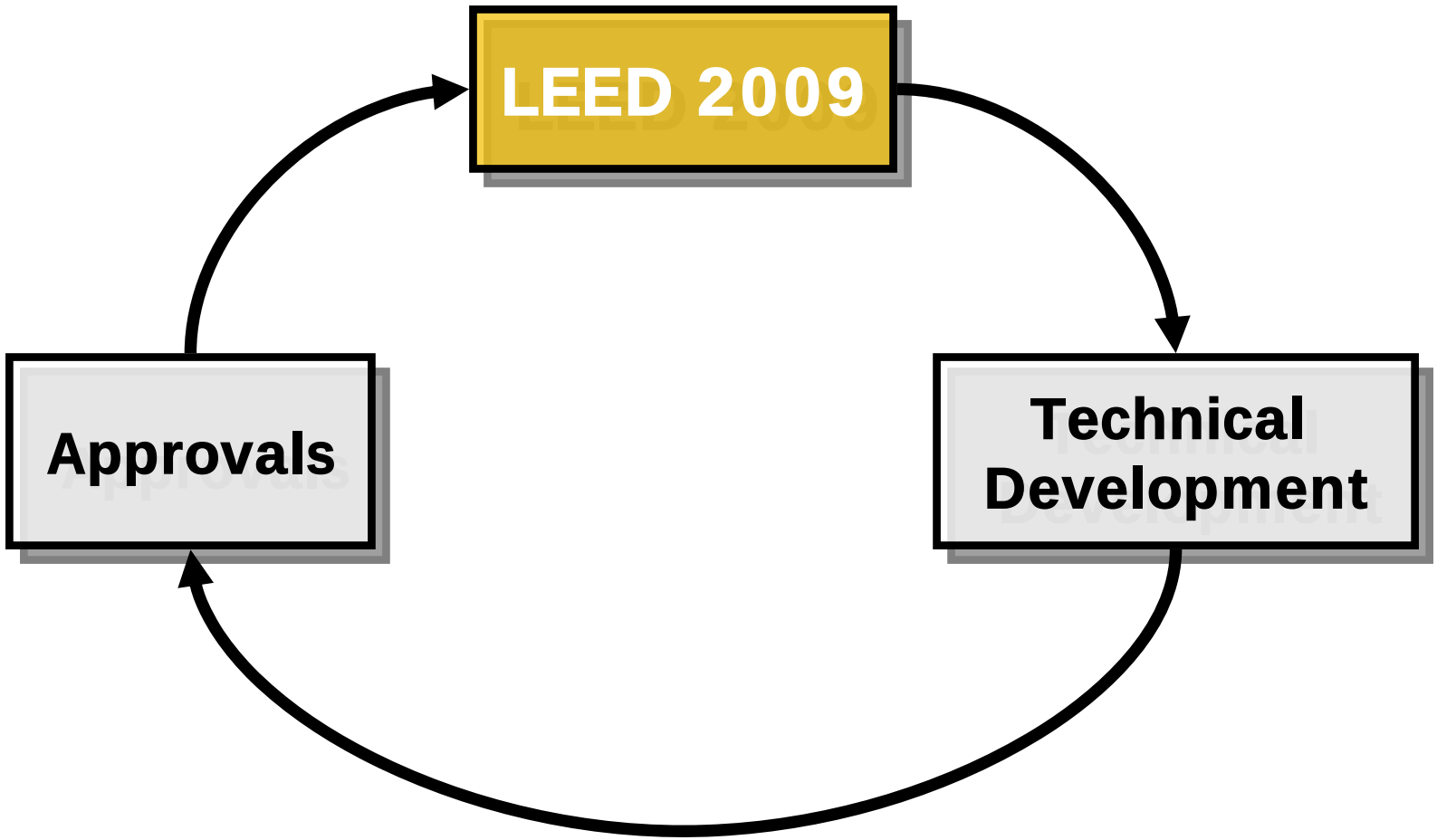
LEED 2009 Rating System

Credit Harmonization



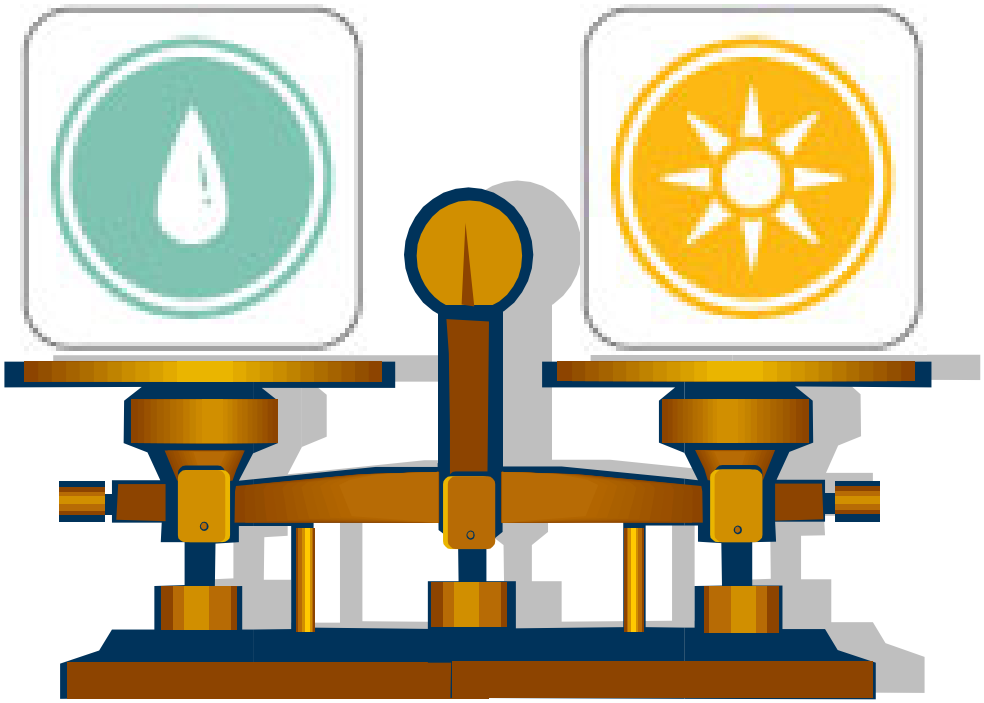
LEED 2009 Rating System

Predictability



LEED 2009 Rating System

Credit Weightings



LEED 2009 Rating System

Credit Weightings

- 100 Points
- Use of TRACI Tool
- Separated out Innovation Points
- Added Regional Credits

LEED 2009

Regional Priority Credits

NOW AVAILABLE

Regional Priority Credits

Credit Weightings

Urban Florida:

- SSc5.2 Site Development – Maximize Open Space
- MRc1.1 Building re-use Maintain Existing Walls, Floors
- WEc2 Innovative Wastewater Tech
- EAc1 Optimize Energy Performance
- MRc5 Regional Materials
- EQc8.1 Daylight & Views - Daylight

Rural Michigan:

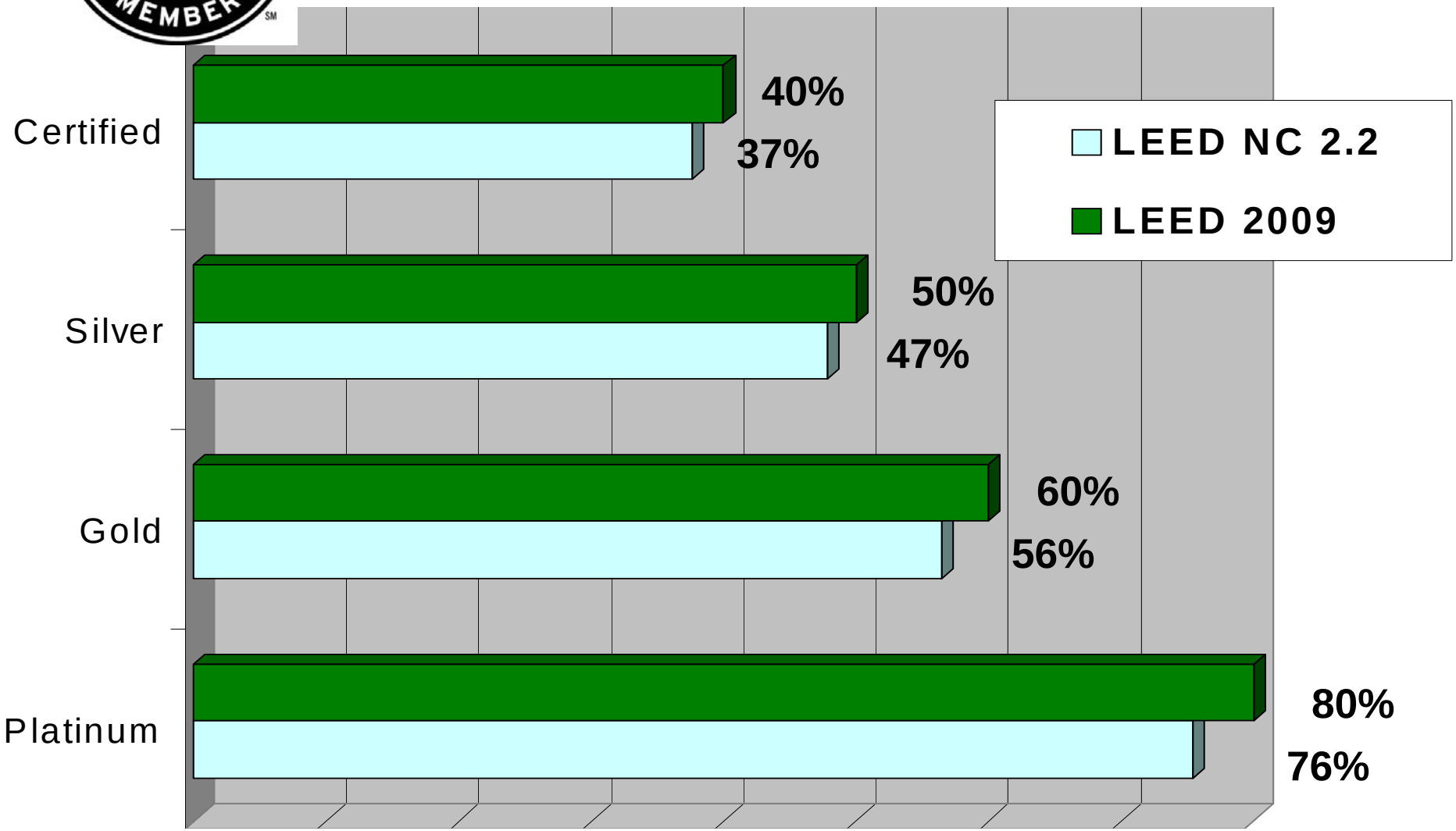
- SSc1 Site Selection
- SSc6.1 Stormwater Design – Quantity Control
- SSc6.2 Stormwater Design – Quality Control
- SSc8 Light Pollution Reduction
- MRc5 Regional Materials
- EAc2 Onsite Renewable Energy

Regional Priority Credits

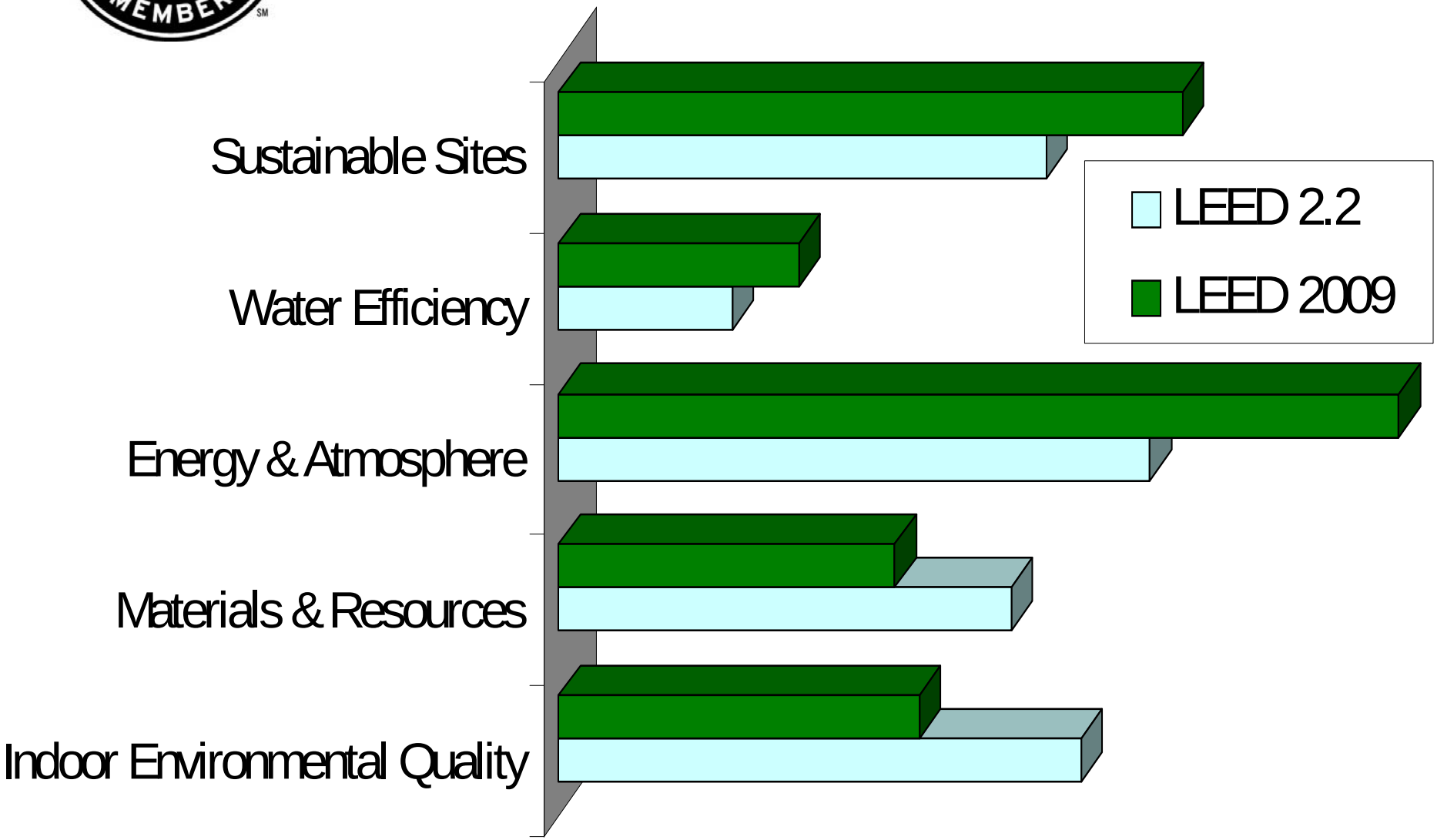
Credit Weightings Sample

20878	SSc6.1	WEc3(40%)	WEc2	EAc2(1%)	MRc1(55%)	MRc2(50%)
20879	SSc6.1	WEc3(40%)	WEc2	EAc2(1%)	MRc1(55%)	MRc2(50%)
20882	SSc1	SSc4.4	SSc5.1	SSc6.1	WEc1, Opt. 1	EAc2(1%)
20886	SSc6.1	WEc3(40%)	WEc2	EAc2(1%)	MRc1(55%)	MRc2(50%)
20895	SSc6.1	WEc3(40%)	WEc2	EAc2(1%)	MRc1(55%)	MRc2(50%)
20901	SSc5.1	SSc6.1	WEc2	EAc1(40%)	EAc2(1%)	MRc1(75%)
20902	SSc5.1	SSc6.1	WEc2	EAc1(40%)	EAc2(1%)	MRc1(75%)
20903	SSc5.1	SSc6.1	WEc2	EAc1(40%)	EAc2(1%)	MRc1(75%)
20904	SSc6.1	WEc3(40%)	WEc2	EAc2(1%)	MRc1(55%)	MRc2(50%)
20905	SSc6.1	WEc3(40%)	WEc2	EAc2(1%)	MRc1(55%)	MRc2(50%)
20906	SSc6.1	WEc3(40%)	WEc2	EAc2(1%)	MRc1(55%)	MRc2(50%)
20910	SSc5.1	SSc6.1	WEc2	EAc1(40%)	EAc2(1%)	MRc1(75%)
20912	SSc5.1	SSc6.1	WEc2	EAc1(40%)	EAc2(1%)	MRc1(75%)
21001	SSc4.1	SSc5.1	SSc6.2	WEc2	EAc1(40%)	EAc2(1%)

LEED NC 2009 Rating System



Percentage of Points by Category



Major Changes

Energy & Atmosphere

- Now worth over ¼ of possible points
- Updates to ASHRAE 90.1 2007
- Minimum of 10% Energy Reduction

Water Efficiency

- New Pre-Requisite Added
- Changed the Percentages
- Greater Weighting

LEED Credits for Plumbing

Sarah A. Balz, PE, CPD, LEED AP
Affiliated Engineers

Plumbing Contractors of America
PCA

SS Prerequisite 1

Construction Pollution Prevention

– Prevent loss of soil by runoff and wind

– Prevent sedimentation of storm water

- Earth Dikes
- Silt Fencing
- Sediment Traps
- Sediment basins

no calculations for this credit

SS Credit 4.2

Alternative Transportation – Bicycle Storage and changing Rooms

– Provide bicycle racks/storage for 5% of users
  - Schools – 5% of students above grade 3

– Provide showers for 0.5% of FTE

SS Credit 6.1

Storm water Design – Quantity Control

Case1 – existing imperviousness ≤ 50%

Option 1 -Prevent post-development peak rate from exceeding pre-development rate

Option 2 - Protect stream channels from receiving erosion

Case 2 – existing imperviousness ≥ 50%

– Decrease post-development volume 25%

SS Credit 6.2

Storm water Design – Quality control

– Reduce impervious cover
  - Green roofs
  - Pervious pavement

– Promote infiltration
  - Rain gardens
  - Bio-swales

SS Credit 6.2 (cont)

- Treat and capture 90% average rainfall
  - Remove 80% post development TSS
  - Rainwater harvesting
  - Retention ponds and open channels

Water infiltrated on-site is considered 100% treated

WE Prerequisite 1 (new)

Water Use Reduction

– Reduce potable water by 20%

– Low or no flow/flush fixtures
– Use harvested rainwater
– Use recycled graywater/wastewater

WE Credit 1 (2 points in v3)

Option 1: Water Efficient Landscaping – Reduce potable water for irrigation by 50%

- Plant species
- Irrigation efficiencies
- Use harvested rainwater
- Use recycled graywater/wastewater

WE Credit 1 (4 points in v3)

Option 2: Water Efficient Landscaping – No potable water for irrigation or no irrigation

- Must meet Option 1
- Path1: Use rainwater, recycled graywater, or wastewater for irrigation
- Path 2: No permanent irrigation at all
  - Temporary irrigation must be removed within 1 year of installation

WE Credit 2 (2 points in v3)

Innovative Wastewater Technologies

– Reduce potable water for sewage conveyance by **50%**

- Option 1 – Low/No flow fixtures or non-potable water
  - Water closets and urinals
  - Use harvested rainwater
- Option 2 - Treat 50% on site to tertiary standards

WE Credit 2 (cont.)

- For this calculation you need to know:
  - Baseline fixture flush rates
  - Occupancy rates
    - FTE, Students/visitors, residents
    - 50% men/50% women
  - Design fixture flush rates (you specify)
  - Amount of reuse/recycled water available
    - Harvested rainwater
    - Recycled graywater/wastewater

WE Credit 2 (cont) (Example WE2.1)

Table 1.1 - Flush Fixture Data - Baseline Case

Fixture Reference	Baseline Fixture Type	Gender	Flush Rate (GPF)	Daily Uses Per Person					Included in Project?
				FTE	Student / Visitor	Retail Customer	Residential		
1	Conventional Water Closet	Female	1.6	3.0	0.5	0.2	5.0		☒
2	Conventional Water Closet	Male	1.6	1.0	0.1	0.1	5.0		☒
3	Conventional Urinal	Male	1.0	2.0	0.4	0.1			☒

30 FTE, 200 Student/Visitor, 10 retail, 10 residential

Annual Baseline Flush Fixture Water Usage =

86,225 gal/year

Baseline rates based on Energy Policy Act of 1992

WE Credit 2 (cont) (Example WE2.1)

Table 2.1 - Flush Fixture Data - Design Case

Fixture Reference	Design Case Fixture Type	Gender	Fixture Manufacturer	Fixture Model	Flush Rate (GPF)	Percent of Occupants	Daily Uses Per Person			
							FTE	Student / Visitor	Retail Customer	Residential
1	Low-Flow Water Closet	Female			1.1	100 %	3.0	0.5	0.2	5.0
2	Low-Flow Water Closet	Male			1.1	100 %	1.0	0.1	0.1	5.0
3	Non-Water Urinal	Male			0.0	100 %	2.0	0.4	0.1	
						%				
						%				
						%				

- Design - specify low and no flow fixtures
  - Waterless urinals
  - High efficiency toilets (1.1 gpf)

WE Credit 2 (cont)

Potable Water Percent Reduction:

1-(design/base) = % water reduction

1-(46,162gal/86,225gal) = 46.4%

NO CREDIT !!

-Try composting toilet for men only

WE Credit 2 (cont) (Example WE2.2)

Table 2.1 - Flush Fixture Data - Design Case

Fixture Reference	Design Case Fixture Type	Gender	Fixture Manufacturer	Fixture Model	Flush Rate (GPF)	Percent of Occupants	Daily Uses Per Person			
							FTE	Student / Visitor	Retail Customer	Residential
1	Low-Flow Water Closet	Female			1.1	100 %	3.0	0.5	0.2	5.0
2	Composting Toilet	Male			0.0	100 %	1.0	0.1	0.1	5.0
3	Non-Water Urinal	Male			0.0	100 %	2.0	0.4	0.1	
						%				
						%				
						%				

New Design Case = 33,275 gallons/year

1-(33,275gal/86,225gal) = 61.4%

2 CREDITS EARNED!!

WE Credit 2 (cont)

- Design case – low flow fixtures and 10,000 gallons harvested rainwater/year

1-[(47,162-10,000)/86,225] = 56.9%

2 CREDITS EARNED !!

WE Credit 2 (cont)

- Option 2 – Treat 50% to tertiary standards and reuse on site
  - Black water treatment systems
  - Engineered wetlands
  - More common in remote areas w/o sewers

WE Credit 3 (2-4 points in v3)

- Reduce potable water use by:

30% (2pts) / 35% (3pts) /40% (4pts) /45% (ID)

note: v3 has lavatory faucets at 0.5 gpm

– Low flow/flush fixtures:

- water closets
- Urinals
- Sensor lavatory faucets
- Showers
- kitchen/break sink faucets

WE Credit 3

- Reduce potable water use by 30% -40%
  - Non-potable water for sewage conveyance:
    - Harvested rainwater
    - Treated Greywater
    - Treated Blackwater

WE Credit 3 (Example WE3.1)

Table 1.1 - Flush Fixture Data - Baseline Case

Fixture Reference	Baseline Fixture Type	Gender	Flush Rate (GPF)	Daily Uses Per Person					Included in Project?
				FTE	Student / Visitor	Retail Customer	Residential		
1	Conventional Water Closet	Female	1.6	3.0	0.5	0.2	5.0		☒
2	Conventional Water Closet	Male	1.6	1.0	0.1	0.1	5.0		☒
3	Conventional Urinal	Male	1.0	2.0	0.4	0.1			☒

Baseline usage for flush fixtures

Annual Baseline Flush Fixture Water Usage =

86,225 gal/year

WE Credit 3 (Example WE3.1)

Table 1.2 - Flow Fixture Data - Baseline Case

Fixture Reference	Baseline Fixture Type	Flow Rate (GPM)	Duration (seconds)	Daily Uses Per Person					Included in Project?
				FTE	Student / Visitor	Retail Customer	Residential		
A	Conventional Lavatory	0.5	15	3.0	0.5	0.2	5.0		☒
B	Conventional Shower	2.5	300	0.1			1.0		☒
C	Kitchen Sink	2.2	15	1.0			4.0		☒
D	Janitor Sink	2.5	15	0.1					☒
E									☐

Baseline usage for flow fixtures

Annual Baseline Flow Fixture Water Usage =

58,281 gal/year

WE Credit 3 (Example WE3.1)

Table 2.1 - Flush Fixture Data - Design Case

Fixture Reference	Design Case Fixture Type	Gender	Fixture Manufacturer	Fixture Model	Flush Rate (GPF)	Percent of Occupants	Daily Uses Per Person			
							FTE	Student / Visitor	Retail Customer	Residential
1	Dual-Flush Water Closet, Full-F	Female			1.6	33 %	3.0	0.5	0.2	5.0
1	Dual-Flush Water Closet, Low-F	Female			1.1	67 %	3.0	0.5	0.2	5.0
2	Dual-Flush Water Closet, Full-F	Male			1.6	100 %	1.0	0.1	0.1	5.0
3	Low-Flow Urinal	Male			0.5	100 %	2.0	0.4	0.1	
						%				
						%				

Design usage for flush fixtures

Annual Design Flush Fixture Water Usage =

67,278 gal/year

WE Credit 3 (Example WE3.1)

Table 2.2 - Flow Fixture Data - Design Case

Fixture Reference	Design Case Fixture Type	Fixture Manufacturer	Fixture Model	Flow Rate (GPF)	Percent of Occupants	Duration (seconds)	Daily Uses Per Person			
							FTE	Student / Visitor	Retail Customer	Residential
A	Ultra Low-Flow Lavatory			0.5	100 %	15	3.0	0.5	0.2	5.0
B	Low-Flow Shower			1.8	100 %	300	0.1			1.0
C	Low-Flow Kitchen Sink			0.5	100 %	15	1.0			4.0
D	Janitor Sink			2.2	100 %	15	0.1			
E					%					
					%					
					%					
					%					

Design Usage for Flow Fixtures

Annual Design Case Flow Fixture = 39,412 gal/year

LEED Credits for Plumbing

WE Credit 3

Potable Water Percent Reduction:

1-(design/base) = % water reduction

1-(106,690gal/144,506gal) = 26.2%

WE 3 P1 – 20% - YES - REQUIRED!!

WE 3 – 35% - NO – 0 CREDITS !!

0 credits

WE Credit 3 (Example WE3.2)

Table 2.2 - Flow Fixture Data - Design Case

Fixture Reference	Design Case Fixture Type	Fixture Manufacturer	Fixture Model	Flow Rate (GPF)	Percent of Occupants	Duration (seconds)	Daily Uses Per Person			
							FTE	Student / Visitor	Retail Customer	Residential
A	Ultra Low-Flow Lavatory			0.5	100 %	15	3.0	0.5	0.2	5.0
B	Low-Flow Shower			1.5	100 %	300	0.1			1.0
C	Low-Flow Kitchen Sink			0.5	100 %	15	1.0			4.0
D	Janitor Sink			2.2	100 %	15	0.1			
E					%					
					%					
					%					
					%					

Reduce flow rates lower

Annual Design Case Flow Fixture = 34,537 gal/year

WE Credit 3

Potable Water Percent Reduction:

1-(design/base) = % water reduction

1-(101,815gal/144,506gal) = 29.5%

WE 3 P1 – 20% - YES – REQUIRED!!

WE 3 – 30% - NO – 0 CREDITS !!

0 credits w/o reuse water

ID Credit – Water Efficiency

Reduce potable water by 45% or more

29.5% > 45%

NO ID CREDIT EARNED !!

The way to earn this ID credit is to restrict more or use reuse water

WE Credit 4 (new)/ ID Credit – WE

- Schools: Reduce Process Water 20% **(new)**
  40% for an ID credit
  - Clothes washers - food steamers
  - Ice machines - pre-rinse spray valves
  - dishwahsers
- Others can obtain this under an ID credit
  - Use chilled water to cool sterilizer effluent vs quench cool with potable water
  - Utilize final rinse water as pre-rinse water

ID Credit – WE Process

Base Equipment

Equipment Type	Number of Units	Cycles per day/unit	Hot water Usage gal/cycle	Cold water usage Gal/cycle	Total Water Use/cycle [gal]	Total Water Use/cycle [gal]
Dishwasher	2	35				
Pre-wash			45	40	85	5950
Wash			45	40	85	5963
First Rinse			45	40	85	5963
Final rinse			45	40	85	5963
Bulk Sterilizer	1	8	0	127	127	8890
20x20 small steam sterilizer	5	4	0	130	130	9100
16x16 small steam sterilizer	2	4	0	136	136	9520
Total usage per Day						**51347.50**

ID Credit – WE Process

Design Equipment

Flush Fixture Type	Number of Units	Cycles per day/unit	Hot water Usage gal/cycle	Cold water usage Gal/cycle	Total Water Use/cycle [gal]	Total Water Use/cycle [gal]
Dishwasher	2	35				
Pre-wash (re-use final rinse)			45	0	45	3150
Wash			45	0	45	3150
First Rinse			45	0	45	3150
Final rinse			45	0	45	3150
Bulk Sterilizer	1	8	0	11	11	770
26x26 medium steam sterilizer	5	4	0	0	0	0
16x16 small steam sterilizer	2	4	0	36	36	2520
Total usage per Day						**15890.00**

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ID Credit – WE Process

Process Water Percent Reduction:

1-(design/base) = % water reduction

1-(15,890gal/51,347.5gal) = 69%

ID WE – 20% - YES – 1 CREDIT !!

EA Credits

- Prerequisite 1 -Fundamental Commissioning
  - BOD updates throughout project
- Prerequisite 2 - Minimum Energy Performance
- Credit 1 – Optimize Energy Performance
- Credit 2 – On-Site Renewable Energy
  - Solar Water Heaters
  - Geothermal
- Credit 3 – Enhanced Commissioning
- Credit 5 – Measurements & Verification

MR Credits

- Prerequisite 1 – Storage and Collection of Recyclables - designed into building

- Credit 2 – Construction waste management
  - Keep track weekly of what comes in and what is recycled or reused - CM or GC keeps record of all trades

Recycle bins on site

EQ Credits

- Credit 4.1 – Low Emitting Materials: Adhesives & Sealants
  - PVC welding < 510 g/L
  - CPVC welding < 490 g/L
  - ABS welding < 325 g/L
  - Plastic cement welding < 250 g/L
  - Adhesive primer for plastic < 550 g/L

- List limits in specification -

Conclusion

LEED items for Plumbing:

- Reduce Water Use
  - Specify Low or No flow fixtures
- Harvest Rainwater or recycle graywater for reuse
  - Flush Water or Irrigation
- Specify Energy Efficient Equipment
  - VFD's, High Efficiency Water Heaters
- Specify Low VOC Sealants and Primers

Be Sure to List in Specifications!

LEED Credits for Plumbing

Thank You