

USGBC & LEED

2007 USACE Infrastructure Systems Conference

Marriott Renaissance Center

25-29 June 2007, Detroit, Michigan

Richard L. Schneider, Assoc. AIA, LEED-AP

Project Manager/Research Architect

U. S. Army Corps of Engineers

Engineering Research & Development Center,

Construction Engineering Research Laboratory



**US Army Corps of Engineers
Engineer Research and Development Center**

PERCEPTION



REALITY

Bank of America Tower
at One Bryant Park
The Durst Organization
Cook + Fox Architects
New York NY
LEED-NC Registered:
Platinum Certification goal



COMMERCIAL REAL ESTATE GOING GREEN

Environmental efficiency is actually the hottest trend in real estate. The challenge is creating demand among tenants.

Special
Reprint
Edition

USA
TODAY
NO. 1 IN THE USA

As seen in
USA
TODAY
Money
July 26, 2006

Building 'green' reaches a new level
REAL ESTATE FINANCE

Real Estate's Latest Movement

green

by
DESIGN

The Green in A

Adobe has turned its headquarter
and is saving millions of dollars

The New York Times
Editorial

FRIDAY, AUGUST 11, 2006

Build Green, Make Green

New York Times
EducationLife

SUNDAY

CONDOLiving

The Greening of America's Campus

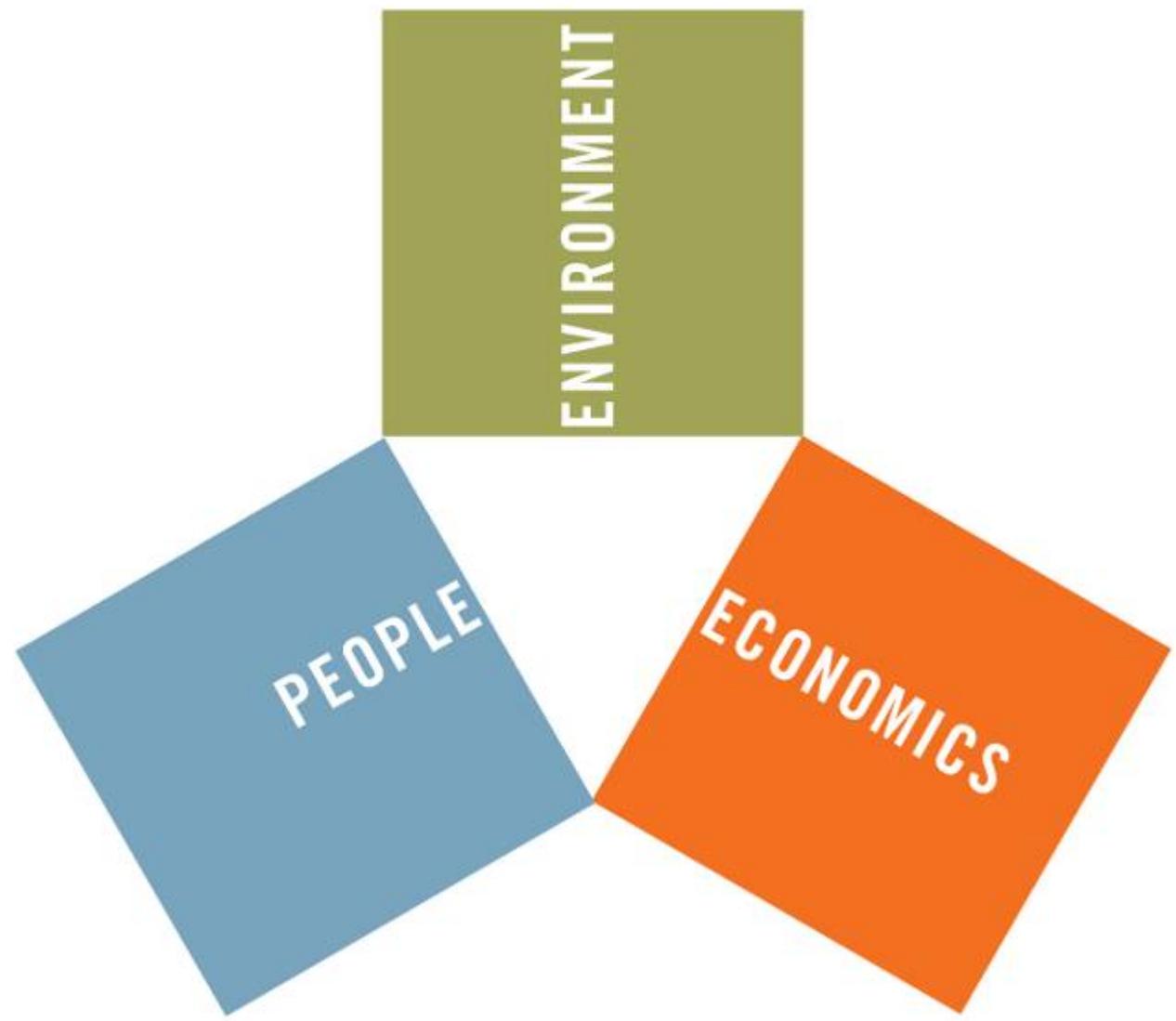
...cling anymore. The sustainability movement
...ow campuses are built, and how students live

It's Easy Being Green

The Washington Post
REAL ESTATE
SATURDAY, APRIL 16, 2005

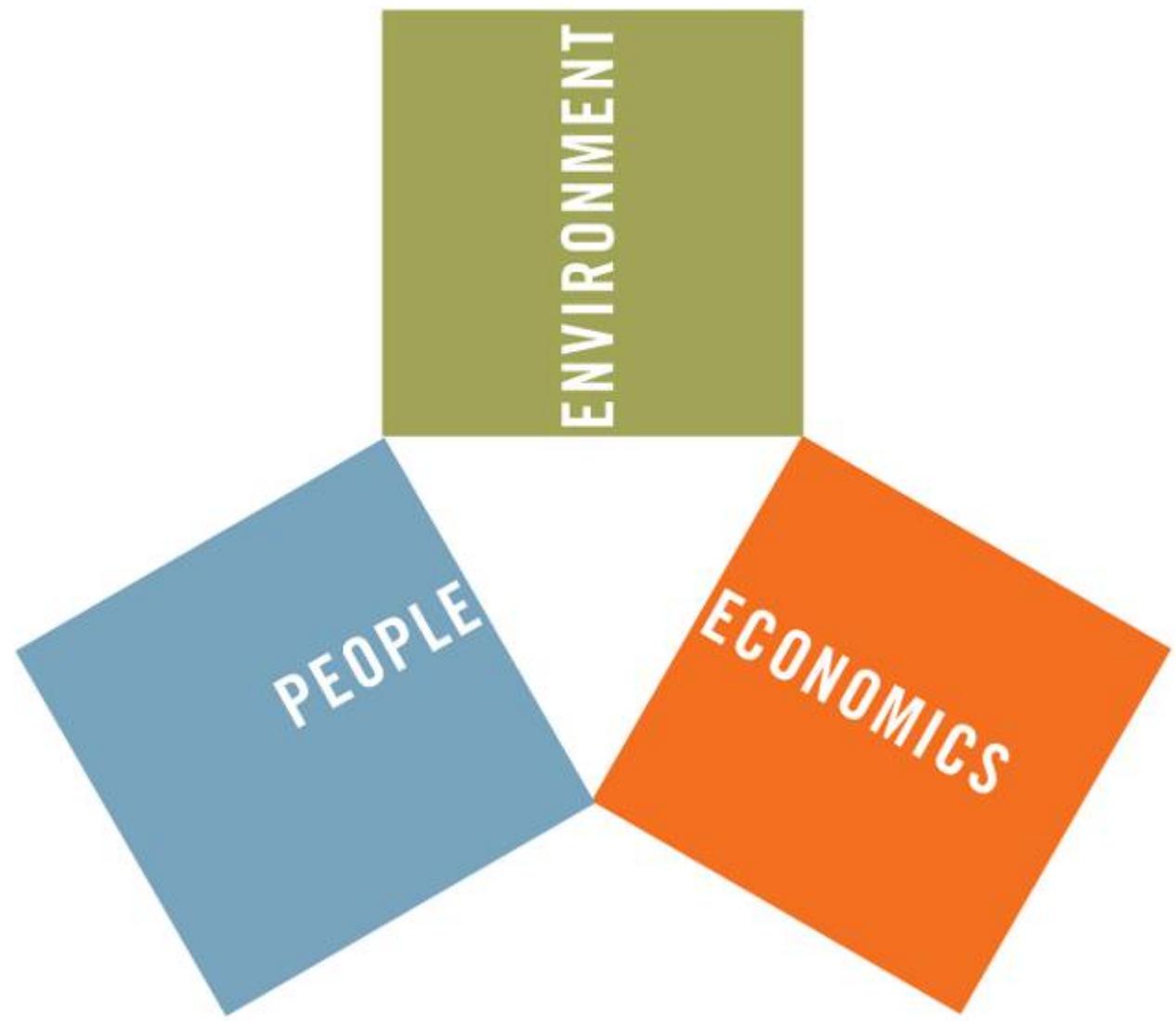


The Triple Bottom Line.



The Triple Bottom Line.

Reduced Environmental Impact.
Peak Efficiency.
Improved Capitalization Rates.
Increased Marketability.
Higher Lease Rates.
Improved Productivity.
Reduced Absenteeism.
Build Green.
Everyone Profits.



Army Definition of Triple Bottom Line



Architects

**Product
Manufacturers**

**Federal,
Local,
and State
Governments**

**Building
Owners**

Nonprofit Leaders

Planners

USGBC

Engineers

**Financial
Planners**

**Interior
Designers**

**Utility
Managers**

**Landscape
Architects**

**Building
Tenants**

**Property
Managers**

**Code
Officials**



Who are we?

USGBC is a coalition of the country's foremost leaders from across the building industry. We promote buildings that are:

- 1. Environmentally Responsible**
- 2. Economically Profitable**
- 3. Healthy Places to Live and Work**

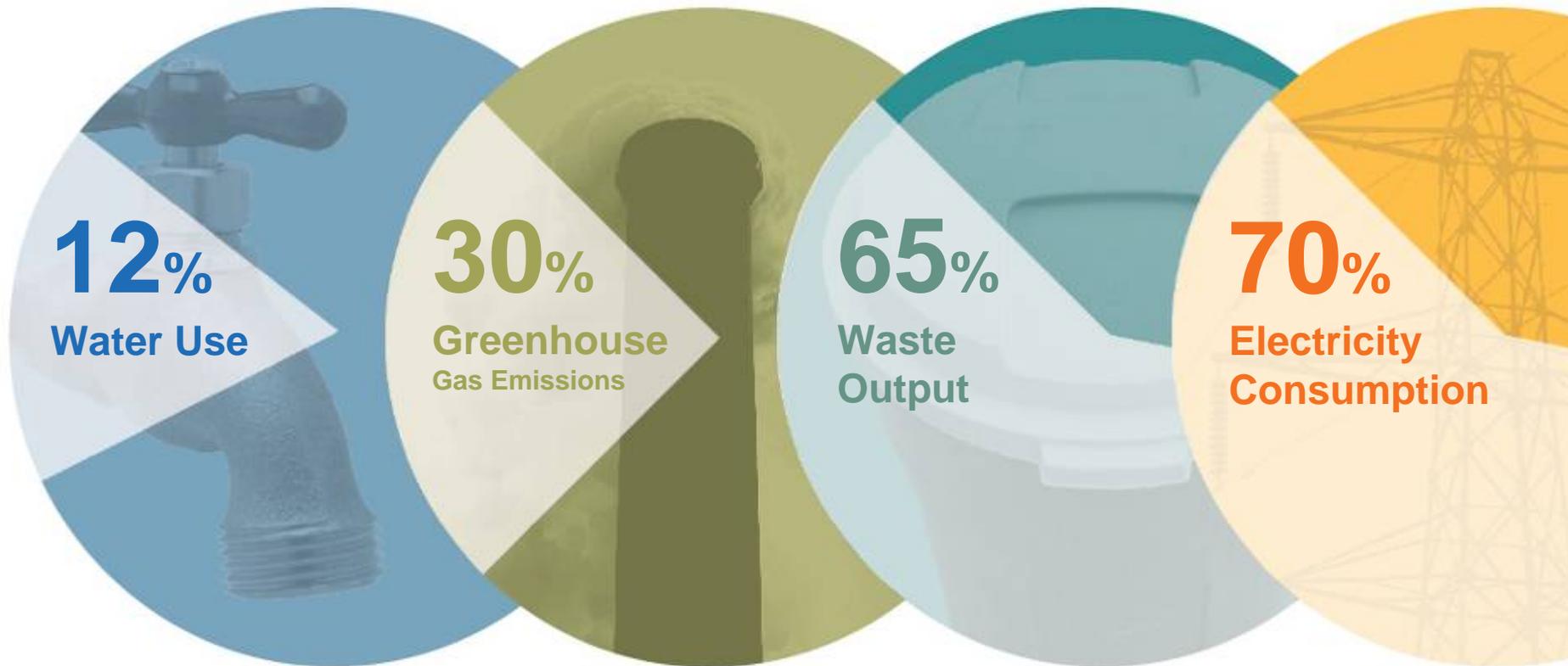


What is green building?

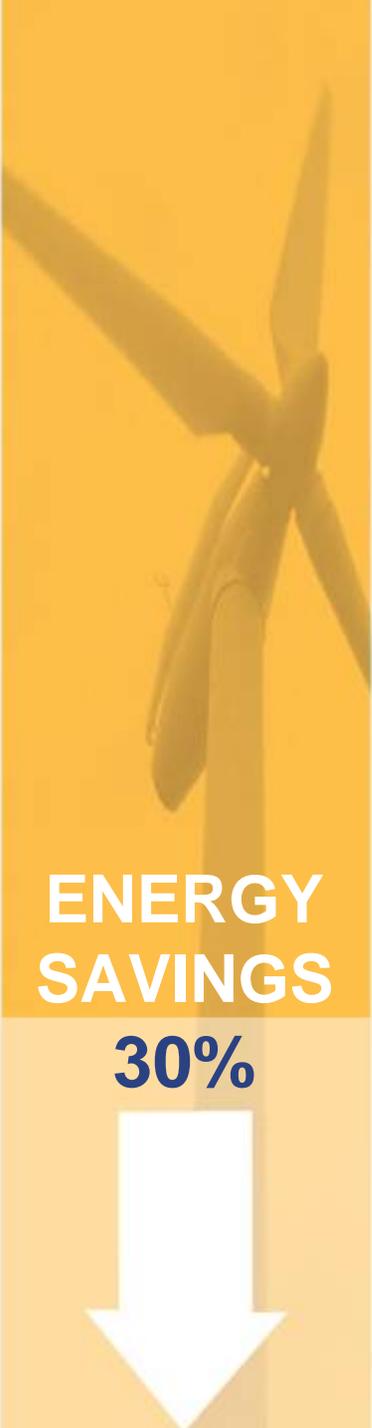
Design and construction practices that meet specified standards, resolving much of the negative impact of buildings on their occupants and on the environment.



U.S. Building Impacts:



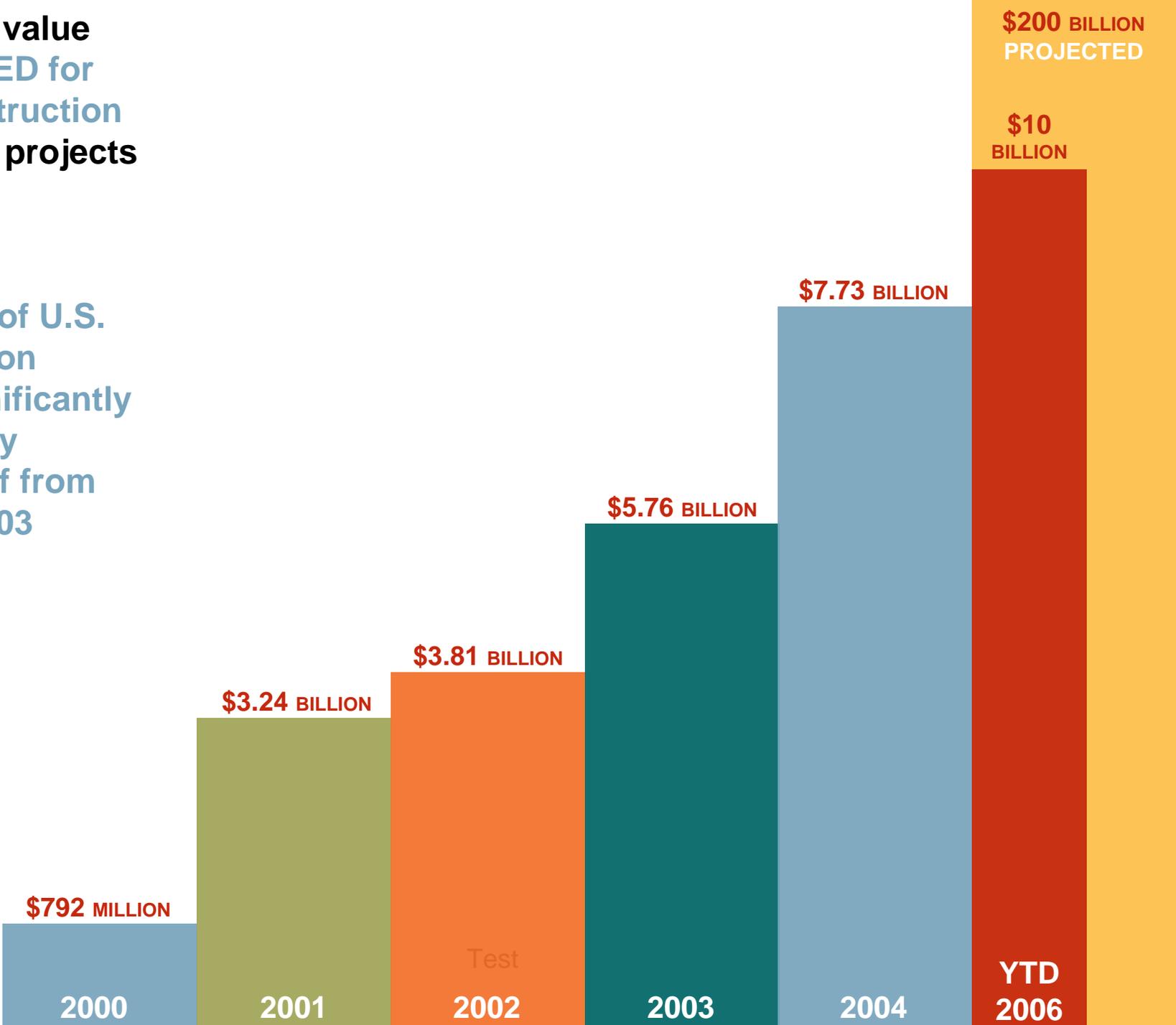
Average Savings of Green Buildings



Source:
Capital E

Estimated value of new LEED for New Construction registered projects

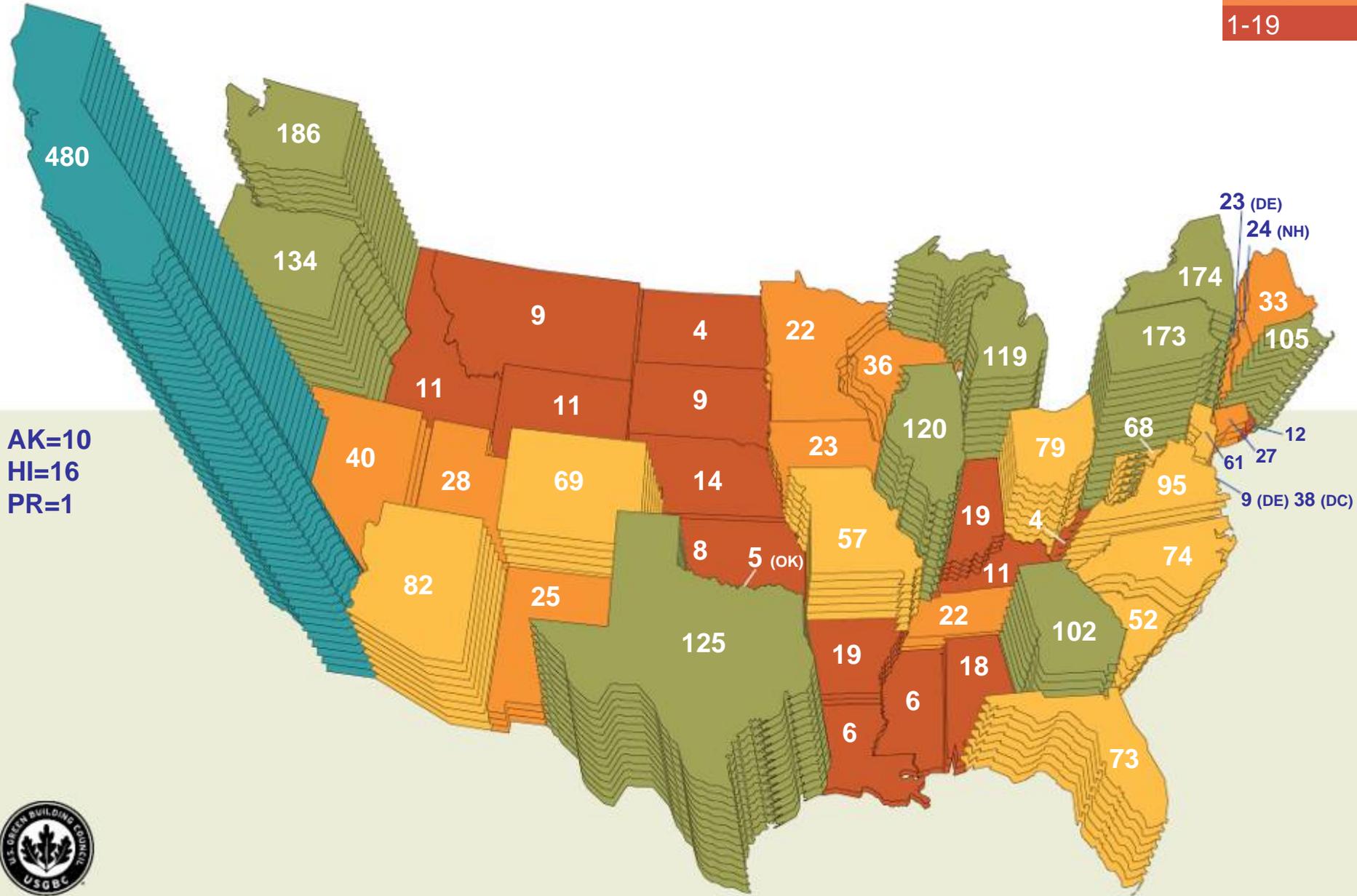
The value of U.S. construction starts significantly declined by almost half from 2000 to 2003



LEED for new construction buildings

as of 07/06

Distribution by geography



Increase in LEED Projects in four years.

2002:
More than
80 million
square feet.

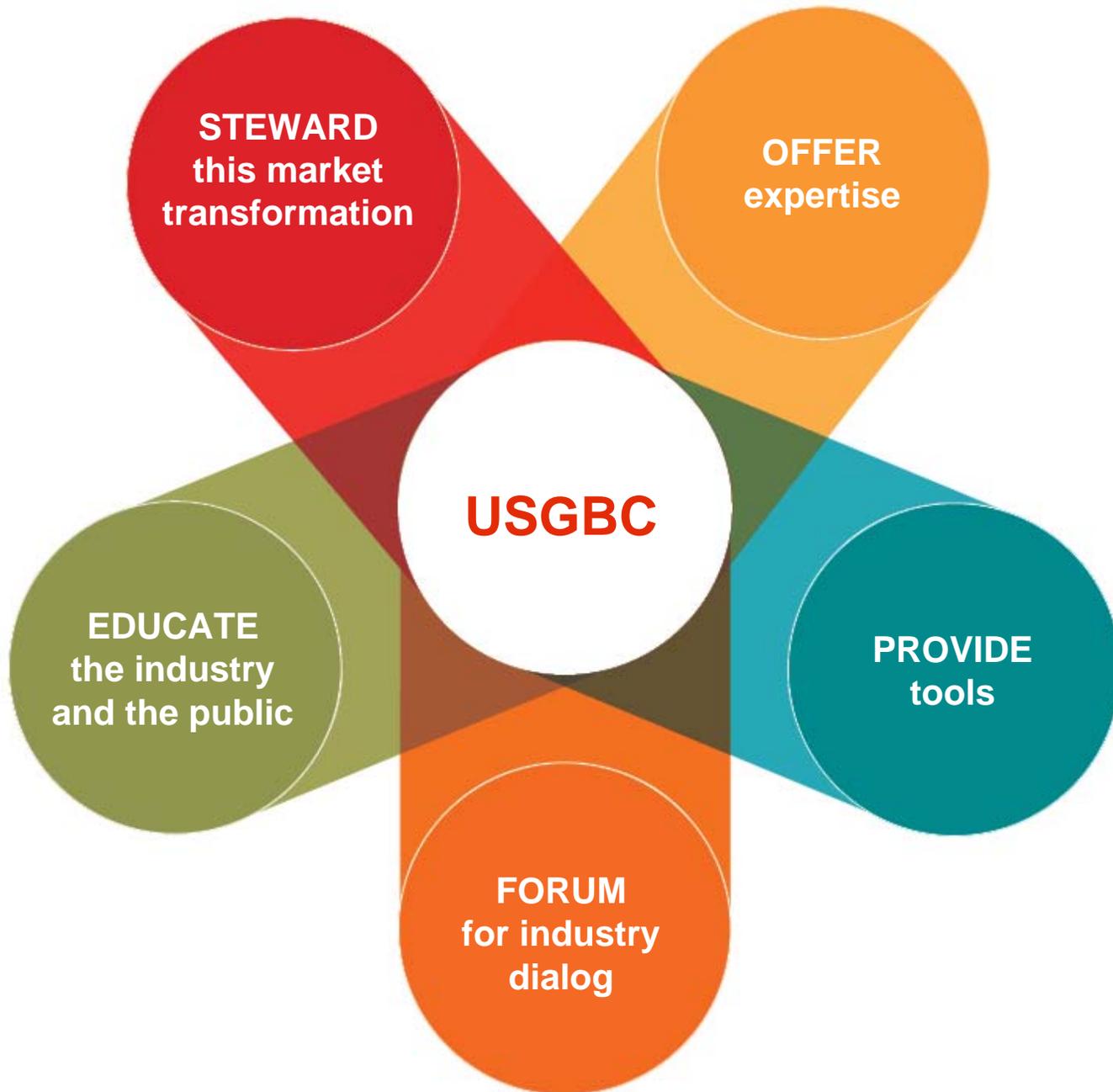
2003:
More than
141 million
square feet.

2004:
More than
180 million
square feet.

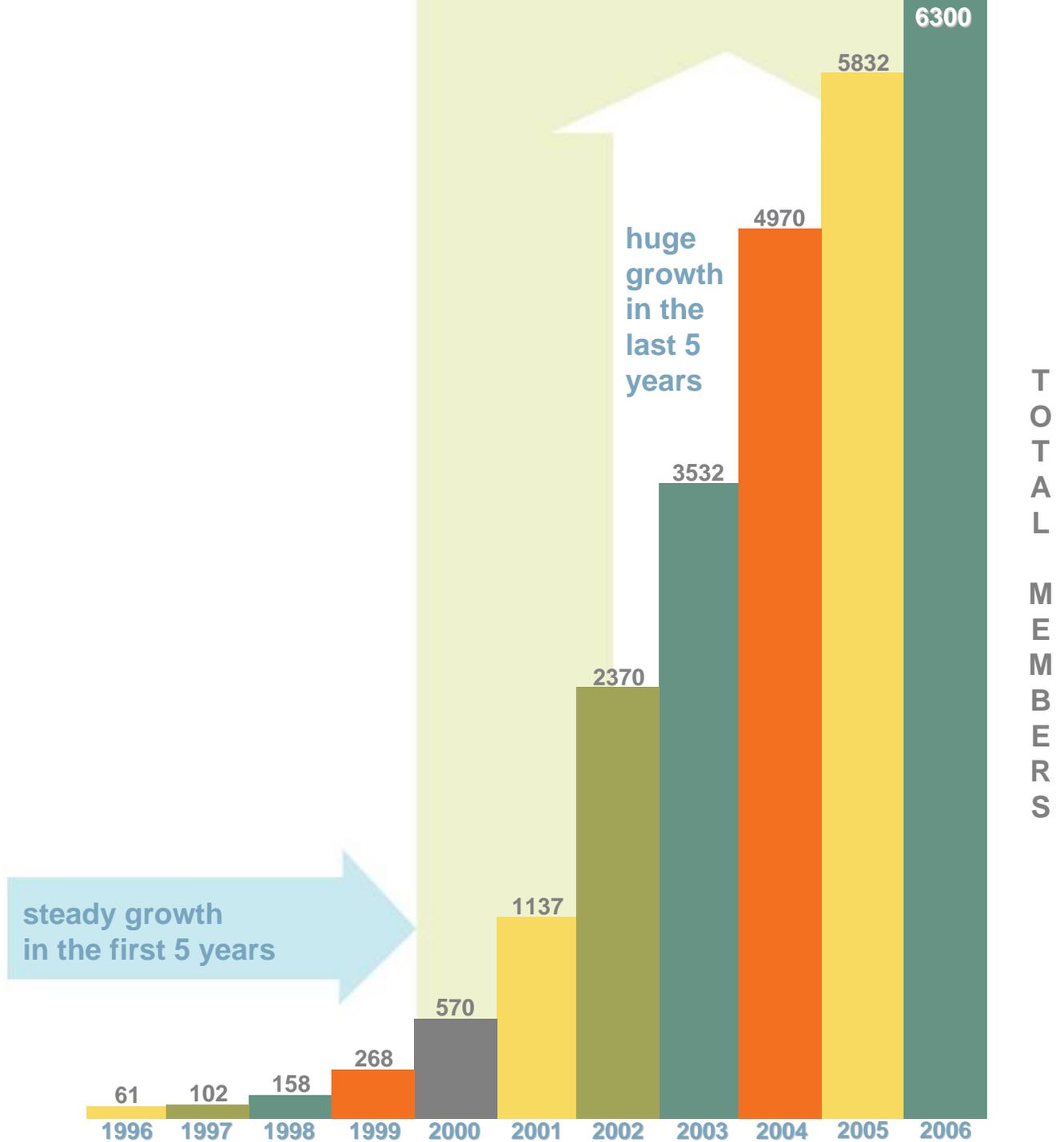
2005:
500 million
square feet.

2006:
642 million
square feet.



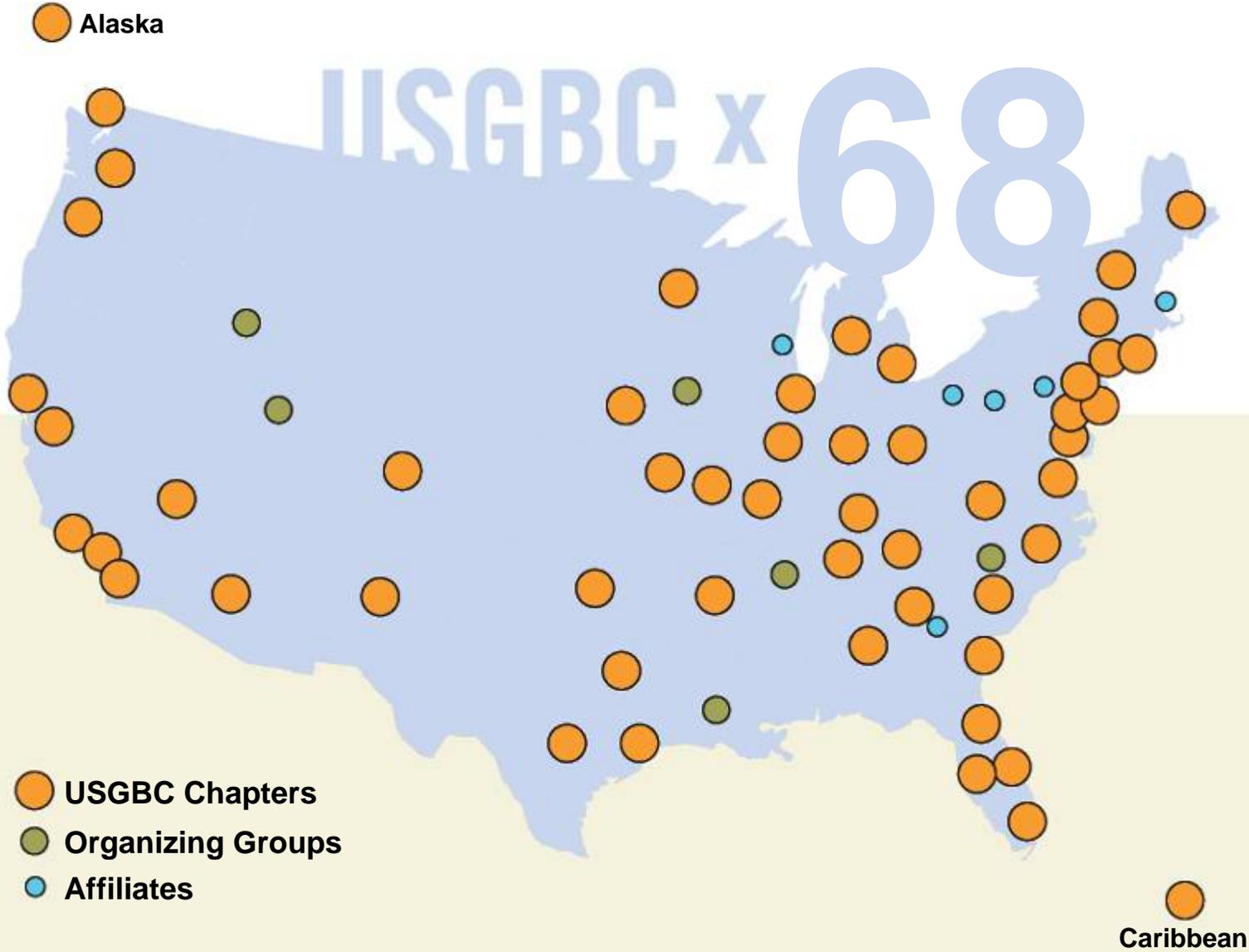


**USGBC
membership
growth reflects
the expansion
of green
buildings in
the market**



USGBC Chapters, Organizing Groups, & Affiliates

As of 04/06





ELJ MORSE

GaffinWood @we Certified

www.cwe.ca

COMPOSITE PANEL ASSOCIATION



T.S.I.
Building Systems
Consulting

The Ideal Solution... Clear Out Your Project...
In Less Time... Save Money...
And Have A Fully Functional Facility!

The World on the Street

T.S.I.

Wood
Building a Sustainable Future

CALMAC
MANUFACTURING CORPORATION

FOR OFF-PEAK
AIR CONDITIONING

HCFC FREE AT LAST
ENVIRONMENTALLY FRIENDLY POLYURETHAN INSULATION



green@work



Nasris, Inc.
EUCOplast™ Phosphorescent Safety Solutions

EXIT

Phosphorescent Safety Solutions

EXIT

LUTRON Lighting Control Solutions

LEYTON ELECTRONICS CO. INC.

enviromdesignworks

envirom design green@work

green@work



WAU
WINDOW A
SYSTEM

SON PARTNERS

Charles Street

J 07030

40

48

onpartners.com

CK, AIA, LEED AP

AL ARCHITECT

29,000
LEED APs

25
accreditations
per day
(average)





U.S. GREEN BUILDING COUNCIL

LEED CERTIFIED

2006



THE RATIONALE



Green roof at
Ford Rouge
Ford Motor Company
Dearborn MI
LEED-NC Gold



Results of the California Study

33 Diverse Buildings

Built over the last **10** years

Cost construction premiums of **1.8%**



Results of the California Study

5 = \$0

Five buildings had no cost increase at all.

EPA Science and
Technology Center
Kansas EPA
Kansas City KS
LEED-NC Gold



**Results of the
California
Study:**

**Average
Bottom Line
Savings**

**GREEN IMPROVEMENTS PAY FOR
THEMSELVES IN 3 YEARS**

(ANNUAL RETURN ON INVESTMENT IS 25-40%)



The William and
Flora Hewlett
Foundation
Menlo Park CA
LEED Gold



Additional constructions costs for LEED-certified buildings

Average for offices and schools, based on 40 buildings

Conventional Building Cost (100%) Additional Cost

PLATINUM (2 buildings)

6.8%

GOLD (9 buildings)

2.2%

SILVER (21 buildings)

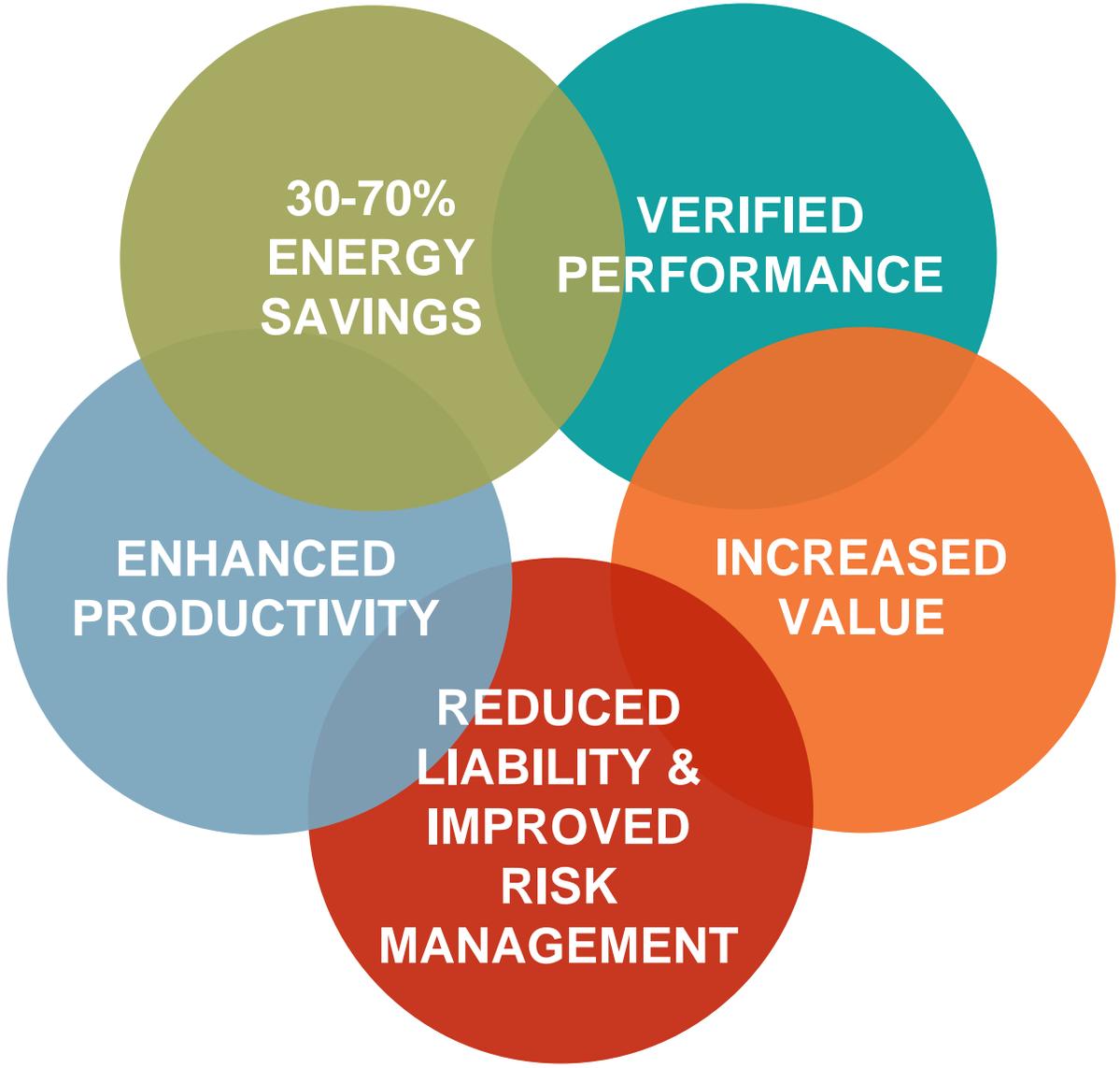
1.9%

CERTIFIED (8 buildings)

.66%

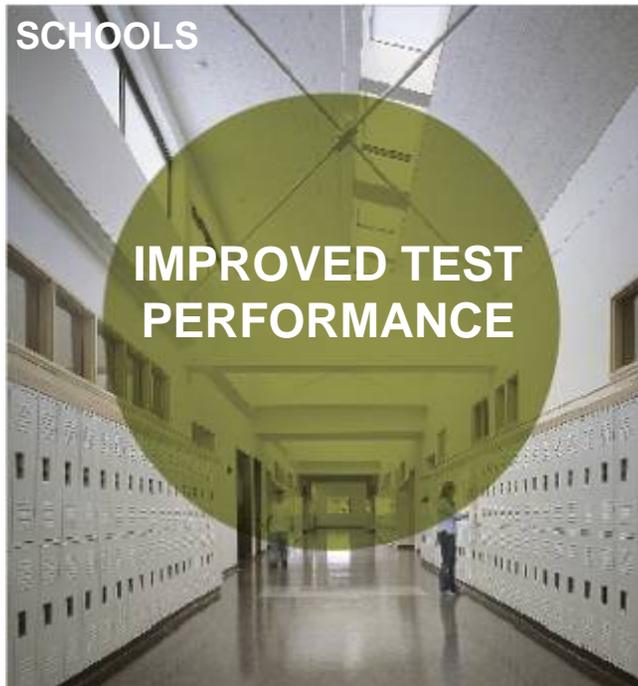


**Improved
Bottom
Line.**



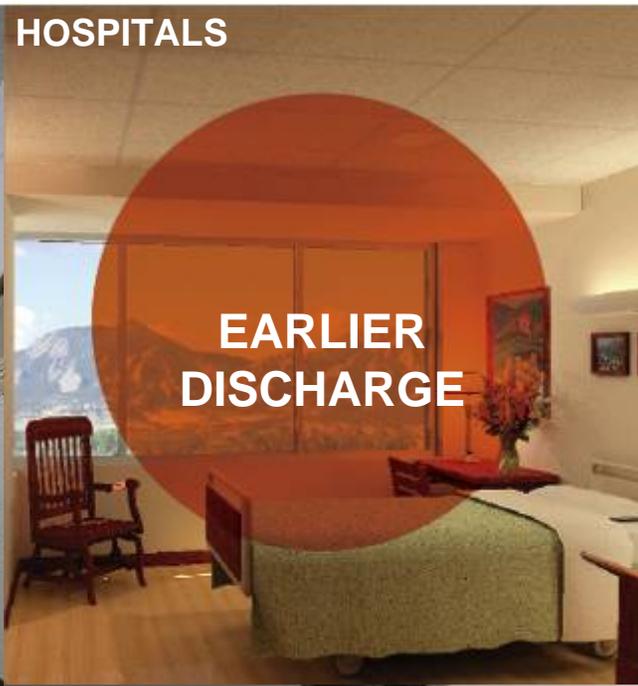
Increased Productivity.

SCHOOLS



IMPROVED TEST PERFORMANCE

HOSPITALS



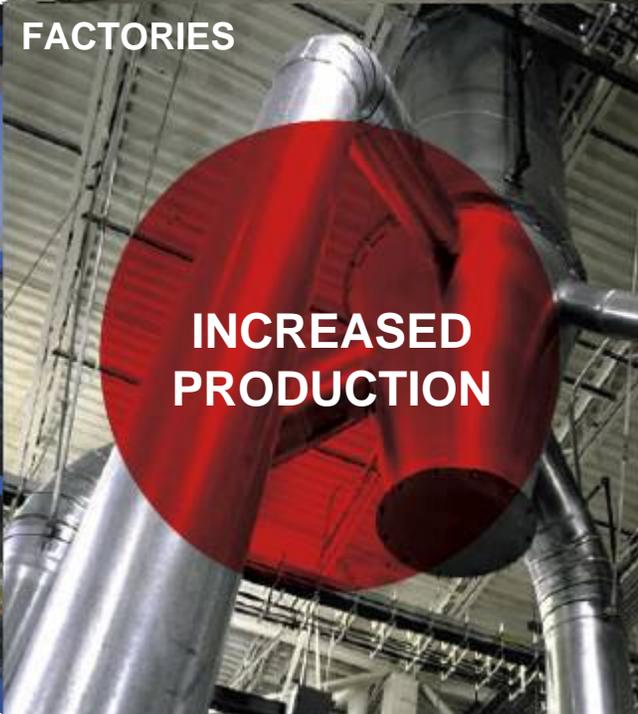
EARLIER DISCHARGE

RETAIL



INCREASE IN SALES PER SQUARE FOOT

FACTORIES



INCREASED PRODUCTION

OFFICES



2-16% PRODUCTIVITY INCREASE

What is the LEED System?



LEED®

LEADERSHIP in
ENERGY and
ENVIRONMENTAL
DESIGN

A leading-edge
system for
certifying
DESIGN &
CONSTRUCTION
of the greenest
buildings in the
world





Nutrition Facts

Serving Size 8 crackers (28g)
 Servings Per Container About 2

Amount Per Serving
Calories 120 Calories From Fat 30
 % Daily Value*

Total Fat 3.5g **5%**
 Saturated Fat 1g **5%**
 Trans Fat 0g
 Polyunsaturated Fat 1.5g
 Monounsaturated Fat 0.5g

Cholesterol 0mg **0%**

Sodium 140mg **6%**

Total Carbohydrate 22g **7%**

Dietary Fiber Less than 1g **3%**

Sugars 7g

Protein 2g

Vitamin A 0% • Vitamin C 0%

Calcium 10% • Iron 4%

* Percent Daily Values are based on a 2,000 calorie diet.

CONTINUED ON OTHER SIDE



What is the LEED System?

LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN

A leading-edge system for certifying
DESIGN, CONSTRUCTION, & OPERATIONS
of the greenest buildings in the world

Scores are tallied for different aspects of efficiency and design in appropriate categories.

For instance, LEED assesses in detail:

1. Site Planning
2. Water Management
3. Energy Management
4. Material Use
5. Indoor Environmental Air Quality
6. Innovation & Design Process

Green Facts

John M. Langston High School
Continuation & Langston-Brown
Community Center
Arlington, Virginia

LEED-NC rating out of	69
Silver	35
Sustainable Site	8
Water Efficiency	3
Energy & Atmosphere	4
Materials & Resources	6
Indoor Environmental Quality	11
Innovation & Design	3

USGBC LEED-NC rated Sept. 3, 2003.



Levels of LEED Ratings

**Green Buildings
worldwide are certified
with a voluntary,
consensus-based
rating system.
USGBC has four
levels of LEED.**



Sustainable Sites

Construction Activity Pollution Prevention

Site Selection

Brownfield Redevelopment

Alternative Transportation:

- Public Transportation Access
- Bicycle Storage & Changing Rooms
- Low Emitting & Fuel Efficient Vehicles
- Parking Capacity

Site Development:

- Protect or Restore Habitat
- Maximize Open Space

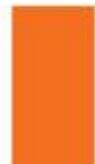
Stormwater Design:

- Quantity & Quality Control

Heat Island Effect:

- Roof & Non-Roof

Light Pollution Reduction



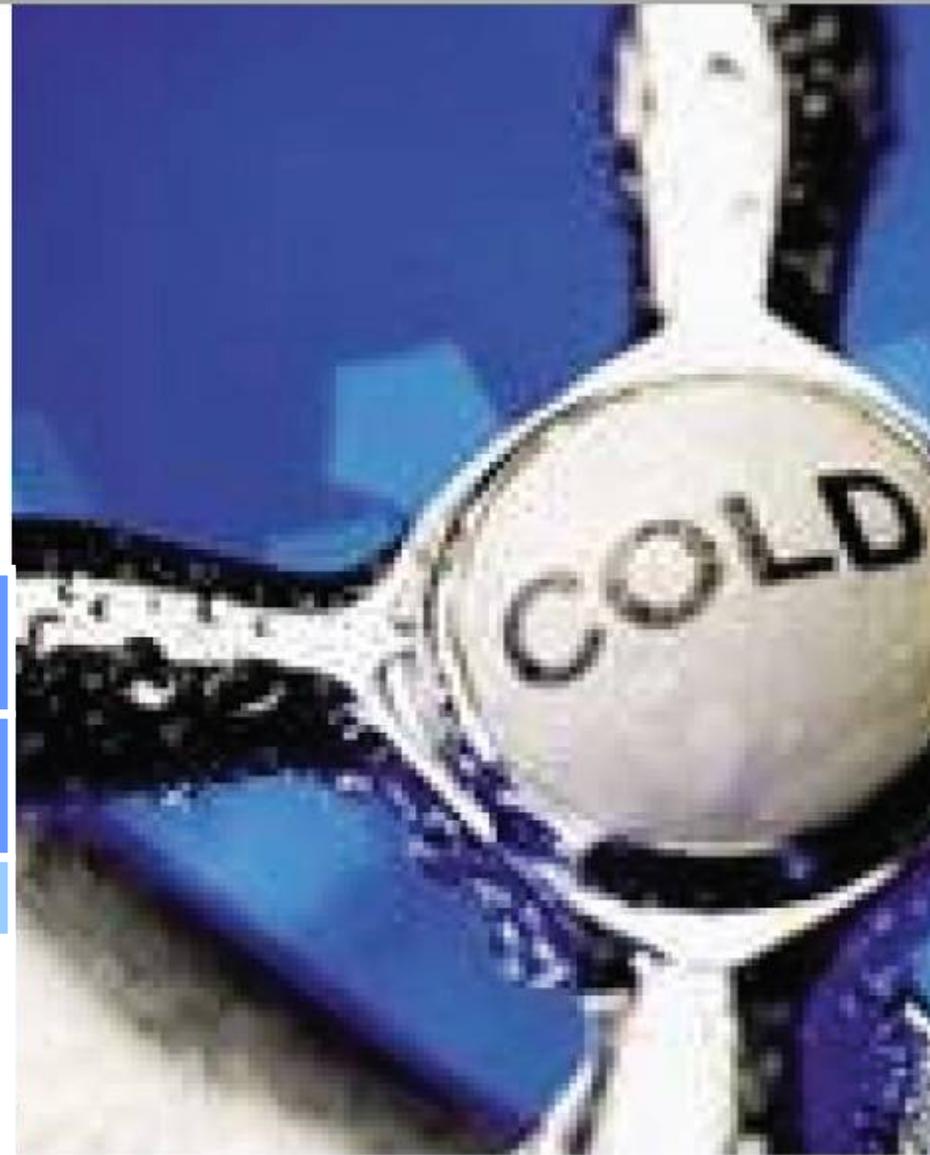
Sustainable Sites

Efficient Water Use

Water Efficient Landscaping

Innovative Wastewater Technologies

Water Use Reduction



Sustainable Sites
Efficient Water Use
Energy & Atmosphere

Fundamental Commissioning of the Building Energy Systems

Minimum Energy Performance

Fundamental Refrigerant Management

Optimize Energy Performance

On-Site Renewable Energy

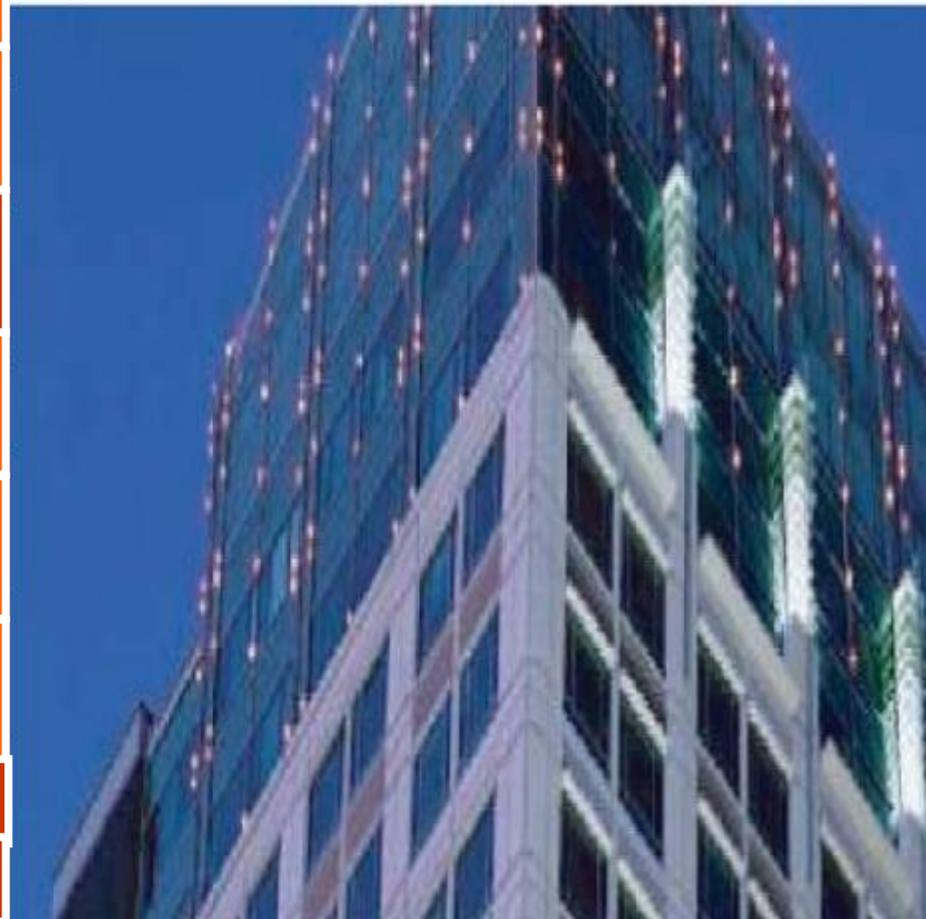
Enhanced Commissioning

Enhanced Refrigerant Management

Measurement & Verification

Green Power

Distributed Generation



Sustainable Sites
Efficient Water Use
Energy & Atmosphere
Materials & Resources

- Storage & Collection of Recyclables**
- Building Reuse**
- Construction Waste Management**
- Materials Reuse**
- Recycled Content**
- Regional Materials**
- Rapidly Renewable Materials**
- Certified Wood**



Sustainable Sites

Efficient Water Use

Energy & Atmosphere

Materials & Resources

Indoor Environmental Quality



Minimum IAQ Performance

Environmental Tobacco Smoke (ETS) Control

Outdoor Air Delivery Monitoring

Increased Ventilation

Construction IAQ Management Plan

Indoor Chemical & Pollutant Source Control

Low-Emitting Materials

Controllability of Systems

Thermal Comfort

Daylight & Views



- Sustainable Sites
- Efficient Water Use
- Energy & Atmosphere
- Materials & Resources
- Indoor Environmental Quality
- Innovation**



Up to 5 additional credits

LAP: 1 Credit

Innovation: 1–4 Credits



immediate

& measurable



LEED ADOPTIONS

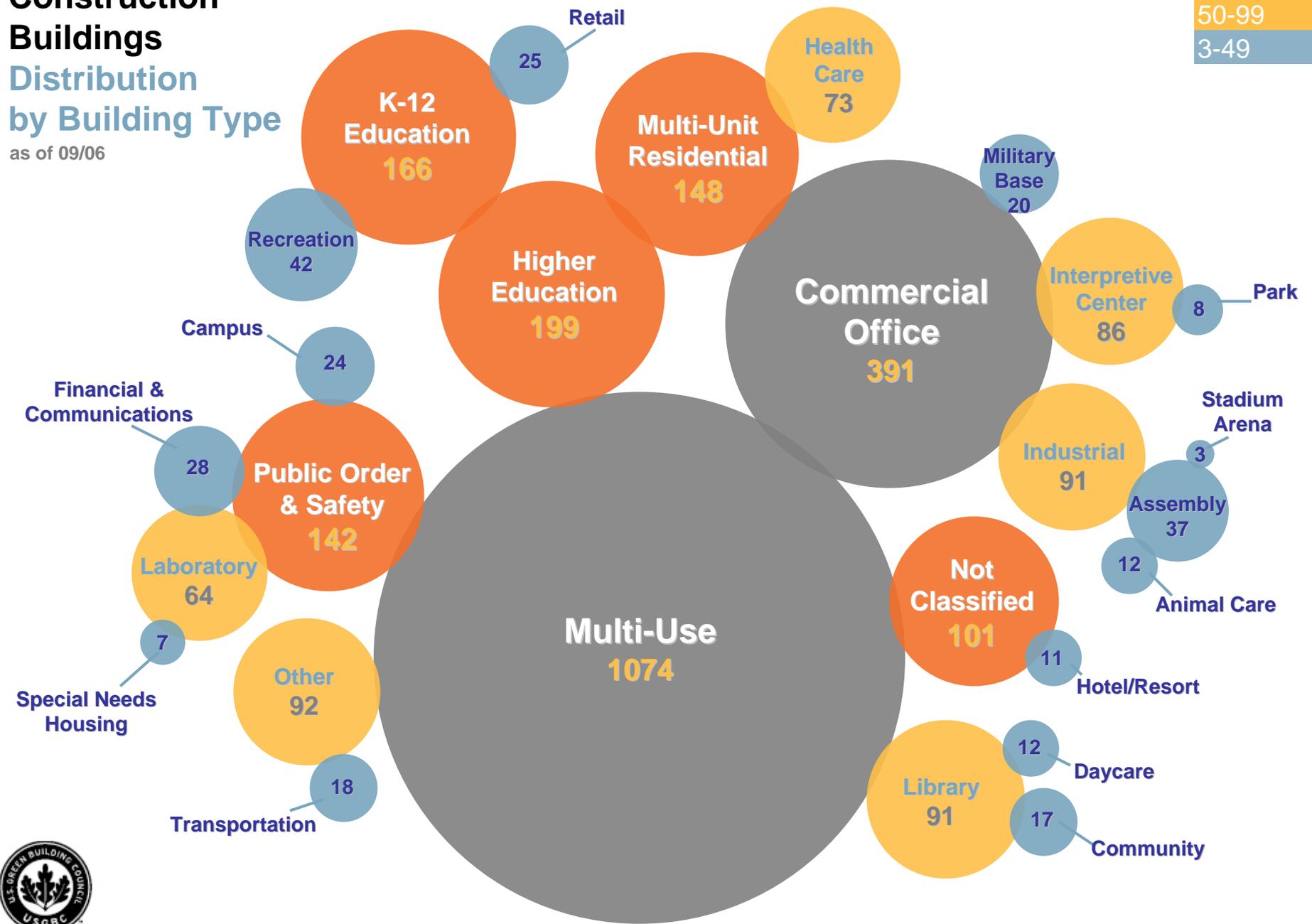


8 Countries
16 States
46 Cities
33 Schools
9 Federal Agencies



LEED for New Construction Buildings Distribution by Building Type

as of 09/06



Categories of LEED Ratings

LEED for New Construction

Adopted 05 Jan 06

LEED for Commercial Interiors

LEED for Existing Buildings

Adopted 27 Apr 07

LEED for Core & Shell

NEW PROGRAMS

LEED for Homes

**Adopt When Released
Fall 07**

LEED for Neighborhood Development

**Under Consideration
for Adoption**

LEED for Schools

Healthcare
Laboratories
Retail
Multi-building Campuses
Multi-family Residential



Taking LEED to the Next Level

Bio-regionally Weighted Credits

LCA as Basis for LEED Credits

Smart Credits

Improved Accounting for:

Energy

Ecological Sites

Transport Implications

IEQ

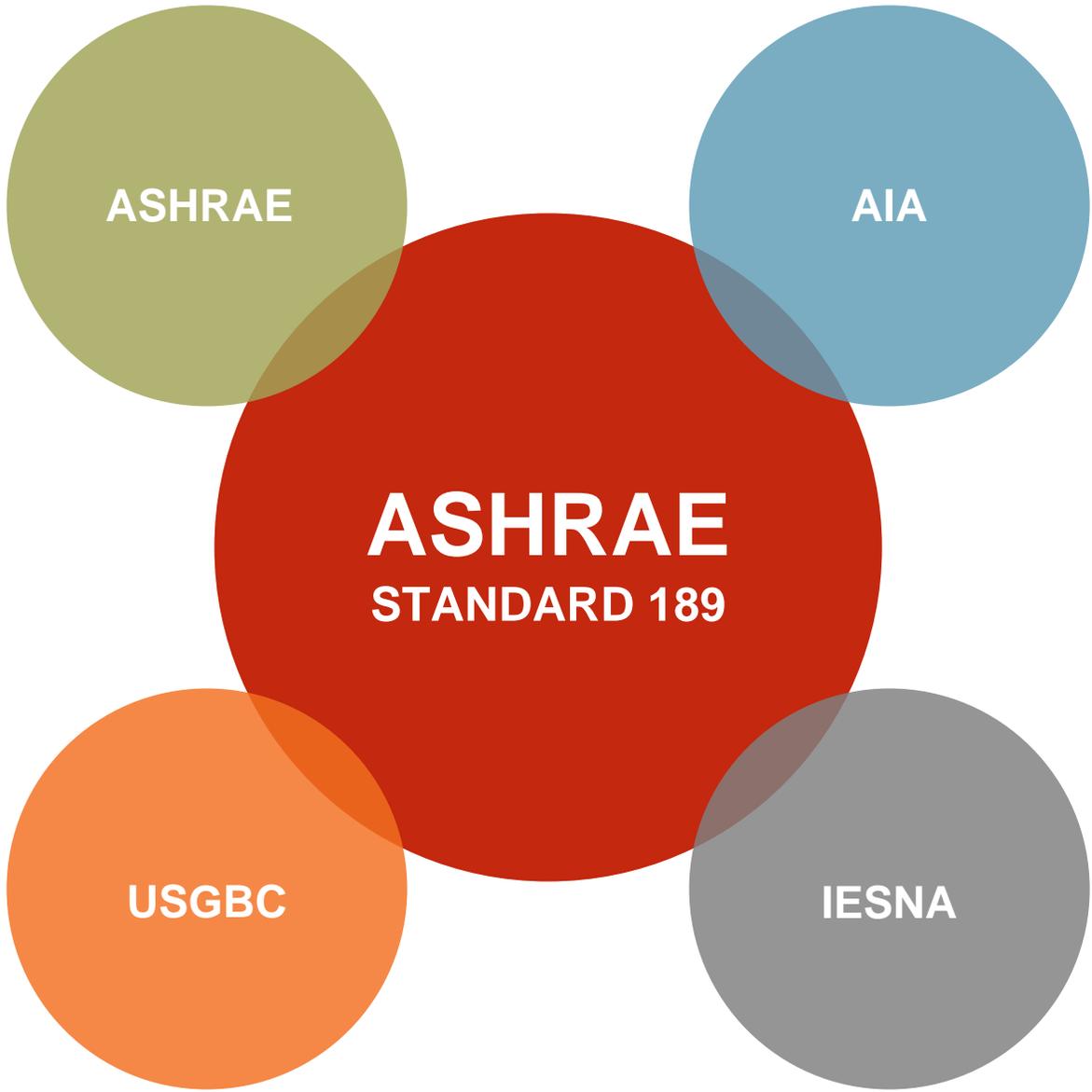
Health

LEED V3



Standard 189

A new minimum green building standard that will serve as a baseline for sustainable building and potentially be incorporated into building code.



Federal USGBC Membership

<http://www.usgbc.org/>

The image shows a screenshot of the USGBC website homepage. At the top left is the USGBC logo. The main header features the text "U.S. GREEN BUILDING COUNCIL" and a navigation menu with links for "Products and Services", "Search", "FAQ", "Contact", "Your Account", and "Sign In". Below this is a secondary navigation bar with links for "ABOUT USGBC", "MEMBERSHIP", "LEED", "EDUCATION", "LEED AP", "RESOURCES", and "CHAPTERS". The main content area is divided into several sections: a blue box with a general mission statement, a green box titled "What is LEED?" with a "Learn More" link, a "TOPIC" sidebar with a dropdown menu, a "What's New" section with several news items, and a "Schools Are Going Green" section. A red circle highlights the "Sign In" link in the top right, and another red circle highlights the "CHAPTERS" link in the bottom right. A green speech bubble in the bottom left contains the text "I am using Nature as a model to improve my designs." A large blue and orange graphic on the right side of the page contains the text "Account | Sign In" and "CHAPTERS".

U.S. GREEN BUILDING COUNCIL
Products and Services | Search | FAQ | Contact | Your Account | Sign In

ABOUT USGBC MEMBERSHIP LEED EDUCATION LEED AP RESOURCES CHAPTERS

USGBC is a community of leaders working to transform the way buildings and communities are designed, built and operated. We envision an environmentally responsible, healthy, and prosperous environment that improves the quality of life.

What is LEED?
The LEED Green Building Rating System is the national benchmark for high performance green buildings. [Learn More.](#)

TOPIC
What's New
Membership
LEED News
Education
Chapters
Green Building 101

What's New

New Energy Credit Required for All LEED Projects
The 2 Optimize Energy Performance Points will contribute to LEED's impact in reducing building energy related greenhouse gas emissions. [Read More...](#)

USGBC makes \$1 Million Commitment to Support Green Building Research
The pledge reflects USGBC's commitment to fostering a sustainable built environment within a generation. [Read More...](#)

LEED for Homes Public Comment Period Now Open
Members are encouraged to comment on the draft rating system. [Read More...](#)

Indoor Air Quality Design Guide in the Works
USGBC is Developing a Design Guide To Help Building's Achieve Improved Indoor Air Quality. [Read More...](#)

Learn about Green Schools
Green schools are healthier for students and teachers, better for the environment, and cost less to operate and maintain. [Read More...](#)

Clinton Foundation Partners with USGBC for Energy Efficiency Program
Program designed to reduce energy consumption in existing buildings. [Read More...](#)

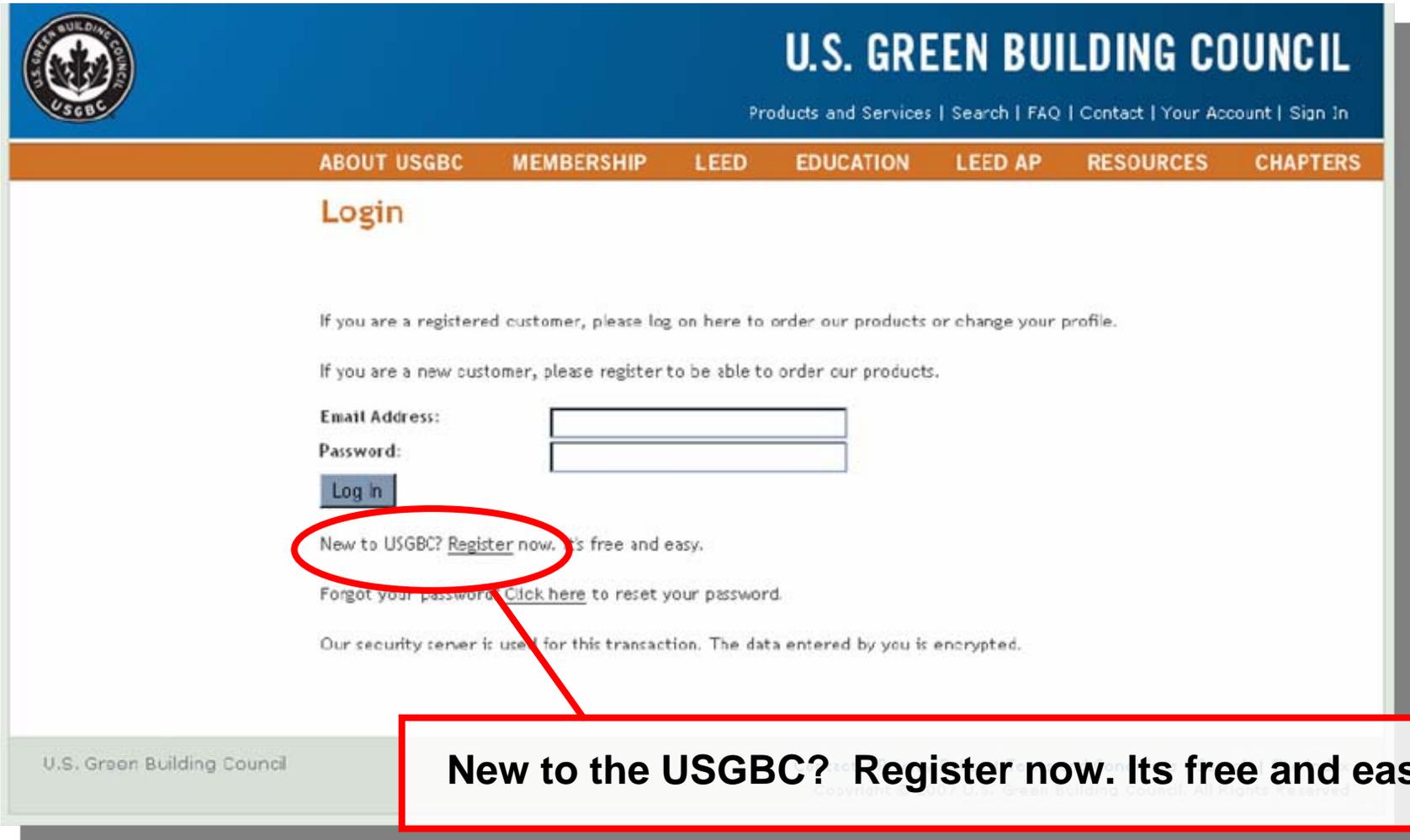
Schools Are Going Green
All across the country, schools are going green to save money, protect the environment, and help kids learn. [Read More...](#)

I am using Nature as a model to improve my designs.

Account | Sign In

CHAPTERS

Federal USGBC Membership



The image shows a screenshot of the U.S. Green Building Council (USGBC) website. At the top left is the USGBC logo. The top right features the text "U.S. GREEN BUILDING COUNCIL" and a navigation menu with links for "Products and Services", "Search", "FAQ", "Contact", "Your Account", and "Sign In". Below this is a secondary navigation bar with links for "ABOUT USGBC", "MEMBERSHIP", "LEED", "EDUCATION", "LEED AP", "RESOURCES", and "CHAPTERS". The main content area is titled "Login" and contains instructions for registered and new customers, followed by input fields for "Email Address" and "Password", and a "Log in" button. A red circle highlights the text "New to USGBC? Register now. It's free and easy." with a red line pointing to a red-bordered box at the bottom of the page that contains the text "New to the USGBC? Register now. Its free and easy." The footer of the page includes "U.S. Green Building Council" and copyright information.

U.S. GREEN BUILDING COUNCIL
Products and Services | Search | FAQ | Contact | Your Account | Sign In

ABOUT USGBC MEMBERSHIP LEED EDUCATION LEED AP RESOURCES CHAPTERS

Login

If you are a registered customer, please log on here to order our products or change your profile.

If you are a new customer, please register to be able to order our products.

Email Address:

Password:

[Log in](#)

New to USGBC? [Register now.](#) It's free and easy.

Forgot your password? [Click here](#) to reset your password.

Our security center is used for this transaction. The data entered by you is encrypted.

U.S. Green Building Council

New to the USGBC? Register now. Its free and easy.

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Site User Registration

General Information

* Title:

* First Name:

* Last Name:

* Address:

* City:

* State/Region:

* Zip/Postal Code:

* Country:

* Telephone Number:

Fax Number:

* Organization:

Job Title:

* Where did you learn about USGBC?:

* Select Your Industry Sector:

If you have been sent a Corporate Access ID:

Corporate Access ID:

If you have been sent any Project Access ID:

Project Access ID #1:

Project Access ID #2:

Project Access ID #3:

Your Email Address will be your user name:

* Email Address:

* Password:

* Verify Password:

Submit Your Registration

USGBC may distribute newsletters or list their settings and preferences in the "Your Account" section.

Users must adhere to the official USGBC Privacy Policy and Terms and Conditions.

Federal USGBC Membership

Corporate Access ID:

U.S. Air Force: Gene Mesick, Air Force Center for Environmental Excellence, 210-536-4216, Gene.Mesick@ brooks.af.mil

U.S. Army: Richard Schneider, Engineering Research & Development Center, 217-73-6752, richard.l.schneider@ erdc.usace.army.mil

U.S. Navy: Dennis Talton, Naval Facilities Engineering Command, 757-322-4211, Dennis.Talton@ navy.mil

Related ISC Sessions

- **#14 – LEED in the Field, Lessons Learned**, Jeanette Fiess, U. S. Army Engineer District, Seattle
- **#s 19-26 – SDD for Construction managers. What do they need to know?** – Rich Schneider, U. S. Army Engineer Research & Development Center, **USGBC Trainers**, and Judy Milton, U. S. Army Engineer District, Savannah -- **LEED for General Contractors/Construction Managers, USGBC** Half-Day Workshop

Product of an Sustainable Design Charrette?

