U.S. Department of Energy
Energy Efficiency and Renewable Energy

federal energy management program

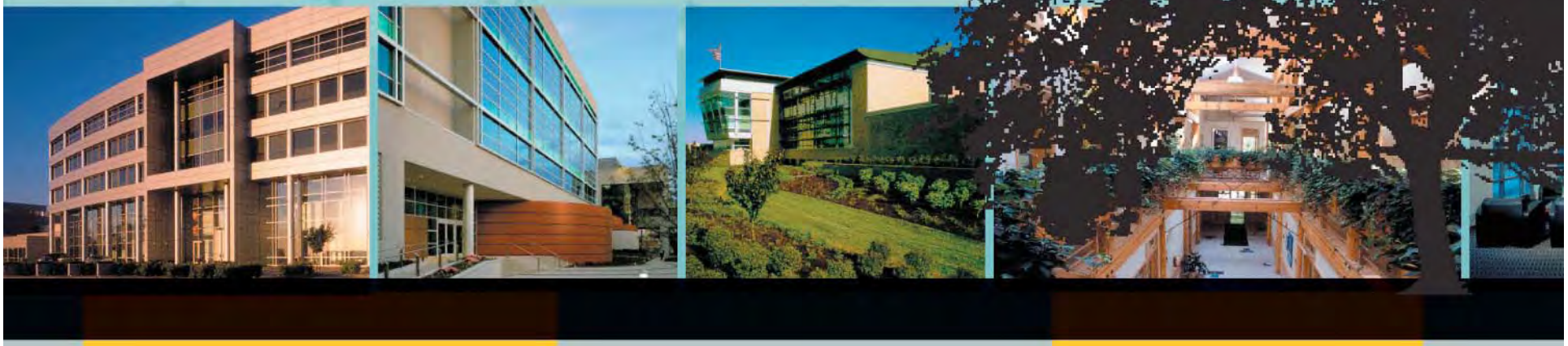
Trends in LEED®

and where do historic buildings fit in?

U.S. Department of Energy
Energy Efficiency and Renewable Energy

Overview of **U.S. Green Building Council** and the **LEED Green Building Rating System®**

October 2005



USGBC's MISSION:

to promote the design and construction of buildings that are environmentally responsible, profitable, and healthy places to live and work.

The organization's activities…

- *Integrate* building industry sectors
- *Lead* market transformation
- *Educate* owners and practitioners

USGBC is...

- A national nonprofit organization
- A diverse membership of organizations
- Consensus-driven
- Committee-based product development
- Developer and administrator of the LEED® Green Building Rating System

What is “Green” Design?

Design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas:

Sustainable site planning

- **Safeguarding water and water efficiency**
- **Energy efficiency and renewable energy**
- **Conservation of materials and resources**
- **Indoor environmental quality**

Environmental Impact of Buildings*

- 65.2% of total U.S. electricity consumption [1]
- > 36% of total U.S. primary energy use [2]
- 30% of total U.S. greenhouse gas emissions [3]
- 136 million tons of construction and demolition waste in the U.S. (approx. 2.8 lbs/person/day) [4]
- 12% of potable water in the U.S. [5]
- 40% (3 billion tons annually) of raw materials use globally [6]

* Commercial and residential

USGBC

- **Core Purpose**
  The U.S. Green Building Council's core purpose is to transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.

U.S. Green Building Council website

Benefits of Green Building

Environmental benefits

- **Reduce the impacts of natural resource consumption**

Economic benefits

- **Improve the bottom line**

Health and safety benefits

- **Enhance occupant comfort and health**

Community benefits

- **Minimize strain on local infrastructures and improve quality of life**

U.S. Department of Energy
Energy Efficiency and Renewable Energy

LEED® Products

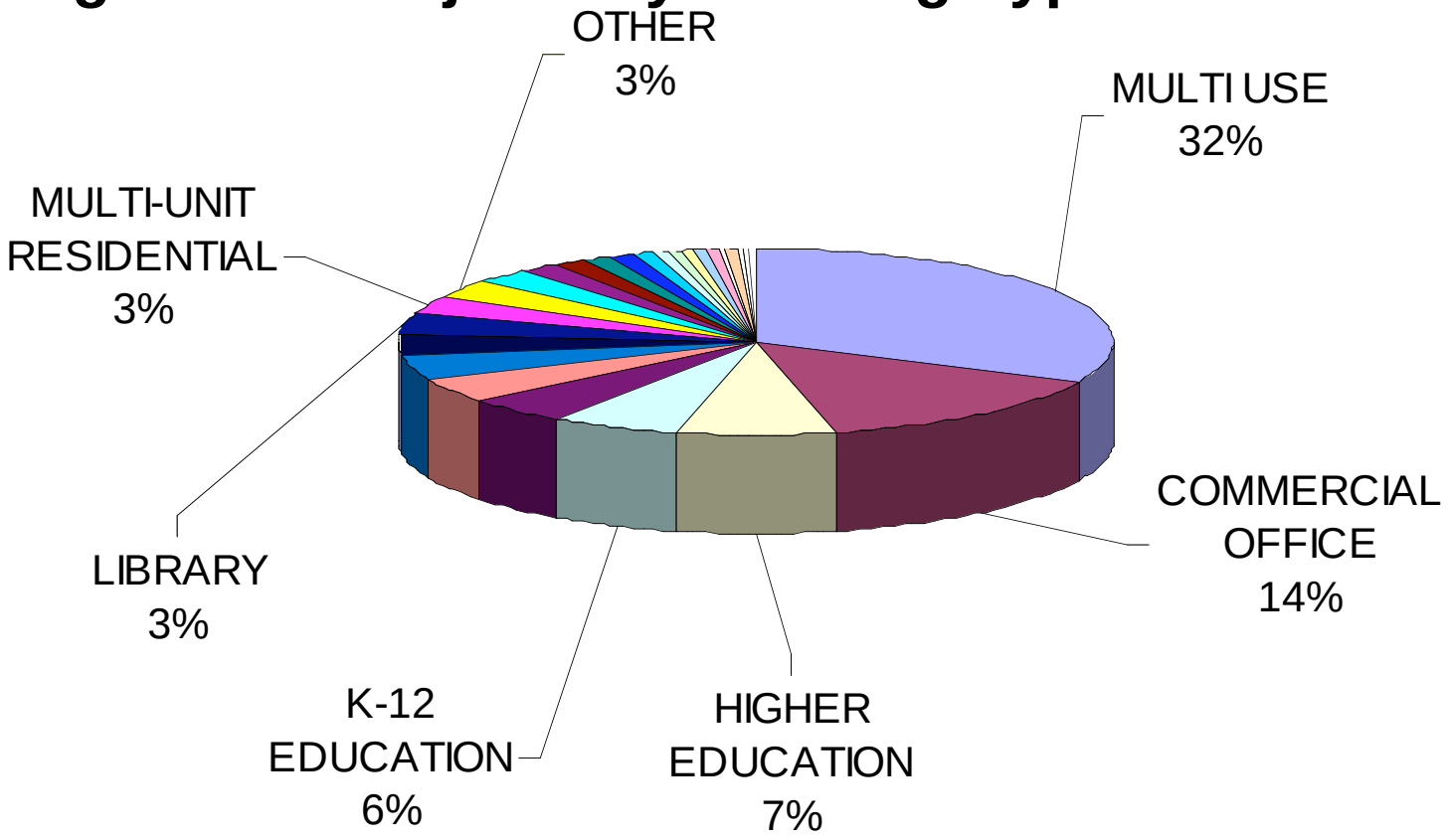
LEED covers many different types of buildings and construction. These are covered under the following LEED products:

LEED-NC: LEED for New Construction and Major Renovations/Additions (for commercial and institutional buildings, released in 2000)
LEED-EB: LEED for Existing Buildings (released 2004)
LEED-CI: LEED for Commercial Interiors (released 2004)
LEED-CS: LEED for Core and Shell (public release: 2005)
LEED-H: LEED for Homes (public release: 2006)
LEED-NC: LEED for Neighborhood Developments

(public release: 2006)

LEED-NC® Market Transformation

- **Registered Projects by Building Type**

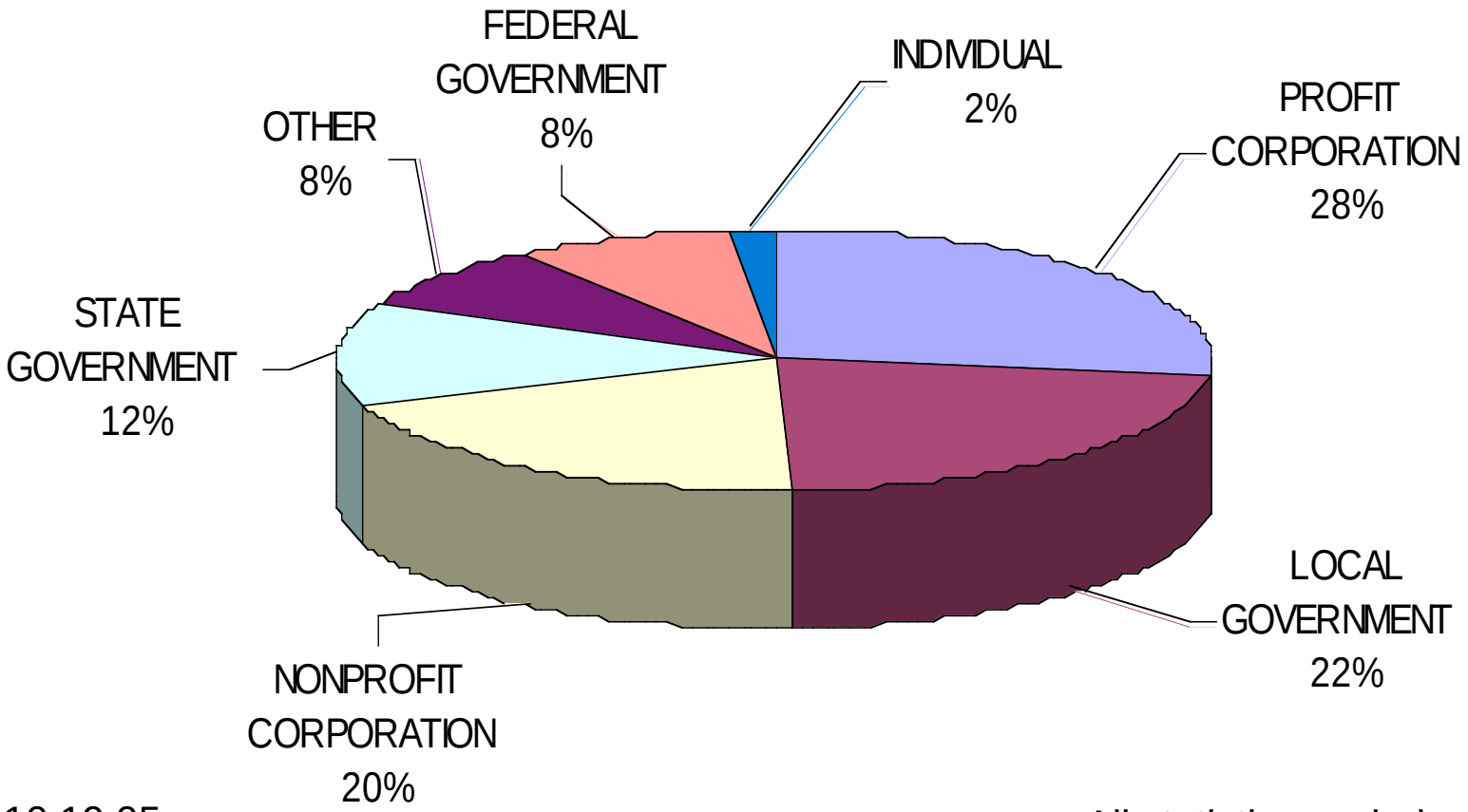


As of 10.19.05

All statistics exclude pilot projects

LEED-NC® Market Transformation

- Registered Projects by Owner Type



As of 10.19.05

All statistics exclude pilot projects

U.S. Department of Energy
Energy Efficiency and Renewable Energy

LEED-NC® in the USA

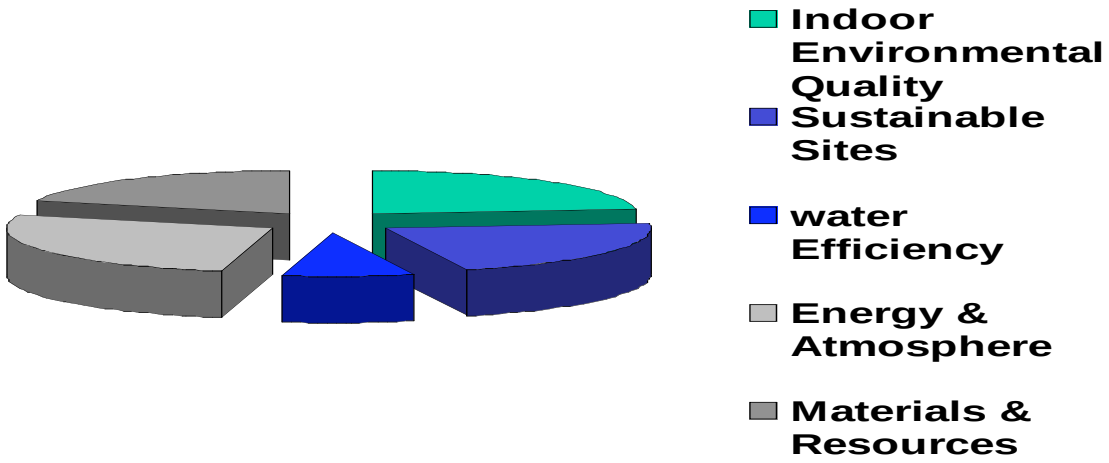
Federal Government Use:

- **General Services Administration (GSA)**
  - LEED Certified projects beginning in 2003
- **U.S. Air Force**
  - LEED Application Guide for Lodging
- **U.S. Army Corps of Engineers**
  - Moving towards LEED
- **Department of State**
- **Department of Energy (DOE)**
- **Environmental Protection Agency (EPA)**
  - Grant for LEED Existing Buildings
- **U.S. Navy**
  - Grant for LEED Residential

But where do Historic Buildings fit in to LEED scenario?

LEED-NC® Point Distribution

Five LEED credit categories



U.S. Department of Energy
Energy Efficiency and Renewable Energy

There is no PERFECT fit

- Major renovations or additions are encouraged to follow LEED-NC

But are a difficult fit

LEED

LEED-NC Version 2.1 Registered Project Checklist

Army Building Renovation

Yes	?	No				
3	4	7	**Sustainable Sites**			14 Points
Y			Prereq 1	**Erosion & Sedimentation Control**		Required
Y			Credit 1	**Site Selection**		1
		N	Credit 2	**Development Density**		1
		N	Credit 3	**Brownfield Redevelopment**		1
		N	Credit 4.1	**Alternative Transportation**, Public Transportation Access		1
	?		Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms		1
		N	Credit 4.3	**Alternative Transportation**, Alternative Fuel Vehicles		1
Y			Credit 4.4	**Alternative Transportation**, Parking Capacity and Carpooling		1
		N	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space		1
		N	Credit 5.2	**Reduced Site Disturbance**, Development Footprint		1
	?		Credit 6.1	**Stormwater Management**, Rate and Quantity		1
		N	Credit 6.2	**Stormwater Management**, Treatment		1
	?		Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof		1
	?		Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof		1
Y			Credit 8	**Light Pollution Reduction**		1

LEED- NC & EB

- Federal Renovations and Adaptive Use projects score easily in
  - Materials & Resources
  - Indoor Environmental Quality
- But struggle for points in
  - Sustainable Sites
  - Energy & Atmosphere
  - Water Efficiency (non-landscape)

LEED-Neighborhood Design

- Aimed at improving land-use patterns, neighborhood designs, smart growth, urbanism and incorporating technology
- Opportunity for Federal application for BRAC and Housing Privatization
- Installations with historic housing can benefit from this approach
- USGBC can learn from Federal whole neighborhood design projects

Historic Preservation

- The principles of historic preservation are rooted in history, culture, stewardship of the built environment, conservation of open space, and creating a sense of place for each community.

Sound familiar?

USGBC's Core Purpose

The U.S. Green Building Council's core purpose is to transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.

Where does this leave historic preservation projects?

- For LEED to work currently, significantly more effort needs to happen at the planning, analysis and design phases of a project to find the best approach within LEED
- Projects with sufficient budget and team determination will make it through the hoops
- Smaller and simpler projects will not have enough “improvements” to meet LEED’s prescriptive rating systems

Where has the synergy gone?

- Historic building projects are hampered by historic fabric
- Where efficiencies might be gained, integrity might be lost
- But historic buildings also retain significant amount of historic fabric and require fewer natural resources in renovations, significant embodied energy and significant cultural value

Considerations

- LEED- ND provides credits for Adaptive Reuse of historic buildings, which is equivalent to same credit for reusing existing building (historic or not) in NC
- The dialogue about historic preservation and LEED has begun but the inherent conflict has not been overcome

The Dialogue

- Must assess the value (energy & cultural) of historic fabric and original energy efficient design
- Must compare a building's energy performance to itself
- Must consider that simple can work too
- Must consider the life-cycle value of historic vs new materials
- Must understand the site constraints of historic buildings and landscapes

Dialogue with Federal Agencies

- Should recognize that the largest building inventory owners, own thousands of rather ordinary, historic, functional buildings
- Want to invest their capital in green and sustainable projects that will minimize operating and maintenance requirements and costs
- Renovate thousands of buildings annually
- Can not afford time, energy or $ to certify all of them
- Work within multiple sustainability policies for which they should pre-qualify for some credits agency-wide and not by individual project (i.e. green procurement, waste management)

Where to from here?

- Federal government needs a green rating system for historic buildings to meet sustainability and energy efficiency
- Rating system should strive for goals that look at true value of embodied energy, energy efficiency rating of historic building systems and individual building performance improvements
- Historic Building rating system could be a hybrid or a new rating system

- Note on GSA LEED Application Guide
  - Good precedent for Federal Rating System guidance