An Introduction to the U.S. Green Building Council and the LEED™ Green Building Rating System

March 2004

U.S. Green Building Council

The nation's foremost coalition of leaders from across the building industry working to promote buildings that are environmentally responsible, profitable, and healthy places to live and work.

The organization’s purpose is to:

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

U.S. Green Building Council

- National nonprofit organization based in Washington, DC
- 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

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

Economic Benefits

Competitive first costs

- Integrated design allows high benefit at low cost by achieving synergies between disciplines and between technologies

Reduce operating costs

- Lower utility costs significantly

Optimize life-cycle economic performance

Productivity Benefits

Improve occupant performance

- Estimated $29 –168 billion in national productivity losses per year [1]
- Student performance is better in daylit schools. [2, 3]

Reduce absenteeism and turnover

- Providing a healthy workplace improves employee satisfaction

Increase retail sales with daylighting

- Studies have shown ~40% improvement [4]

Why Was LEED™ Created?

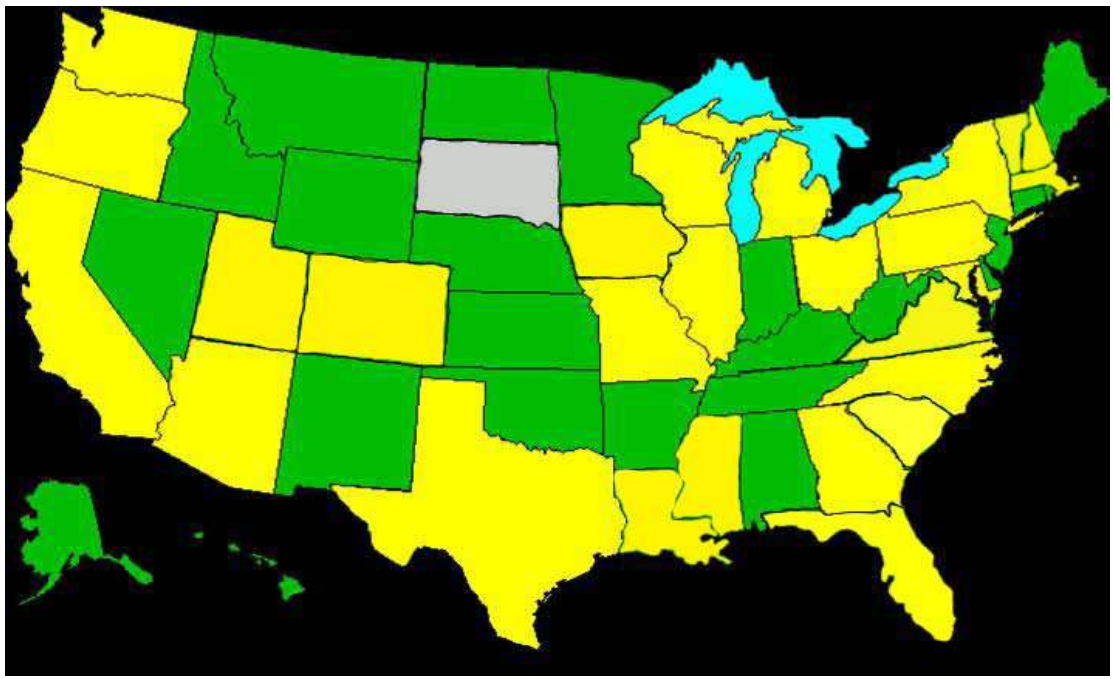
- Facilitate positive results for the environment, occupant health and financial return
- Define “green” by providing a standard for measurement
- Prevent “greenwashing” (false or exaggerated claims)
- Promote whole-building, integrated design processes

Why Was LEED™ Created?

- Use as a design guideline
- Recognize leaders
- Stimulate green competition
- Establish market value with recognizable national “brand”
- Raise consumer awareness
- Transform the marketplace!

LEED-NC™ Market Transformation

- 77 Certified Projects*
- 1017 Registered Projects*

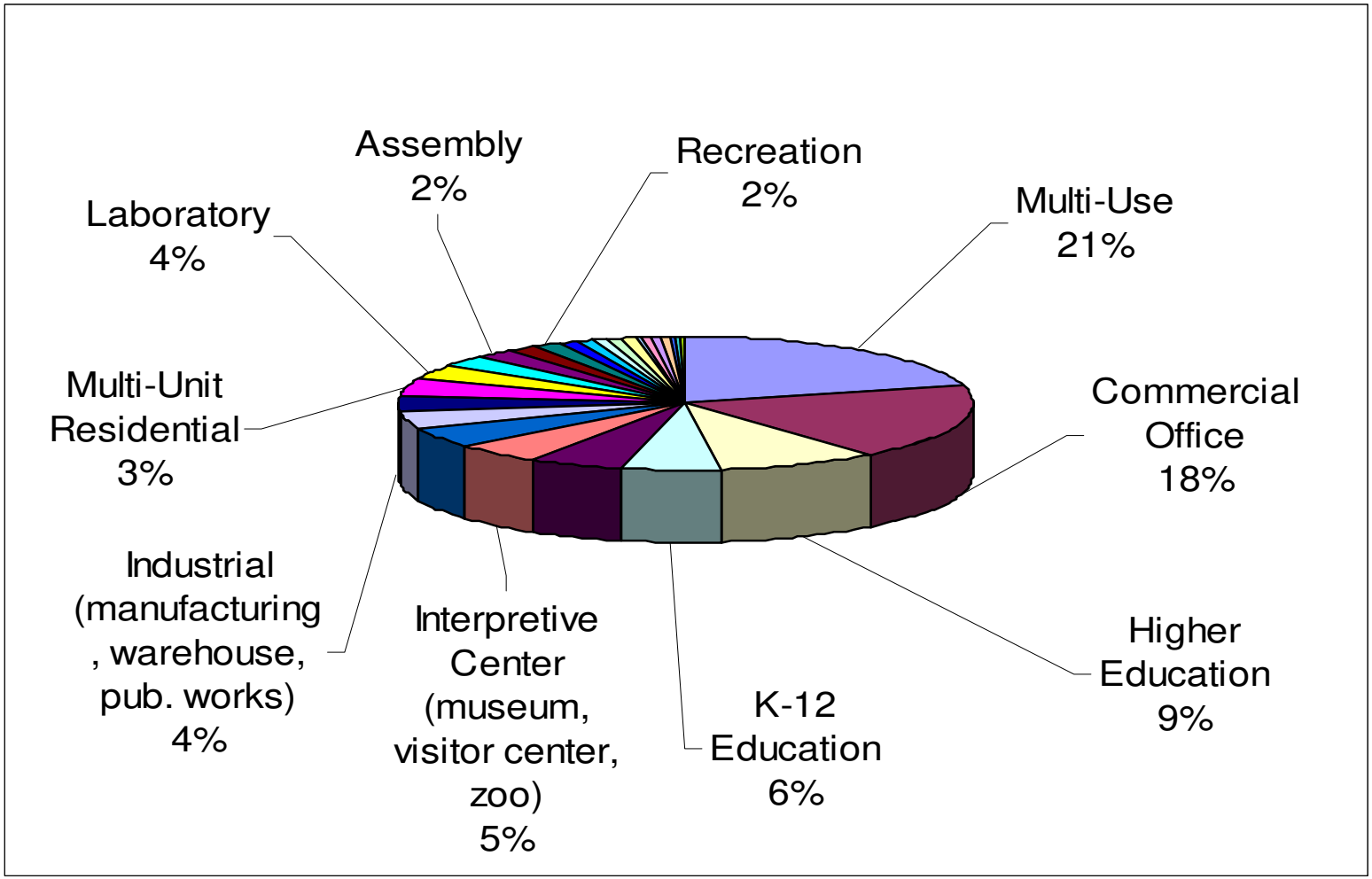


134 M gsf* 49 States 10 Countries*

*As of 11.20.03

LEED-NC™ Market Transformation

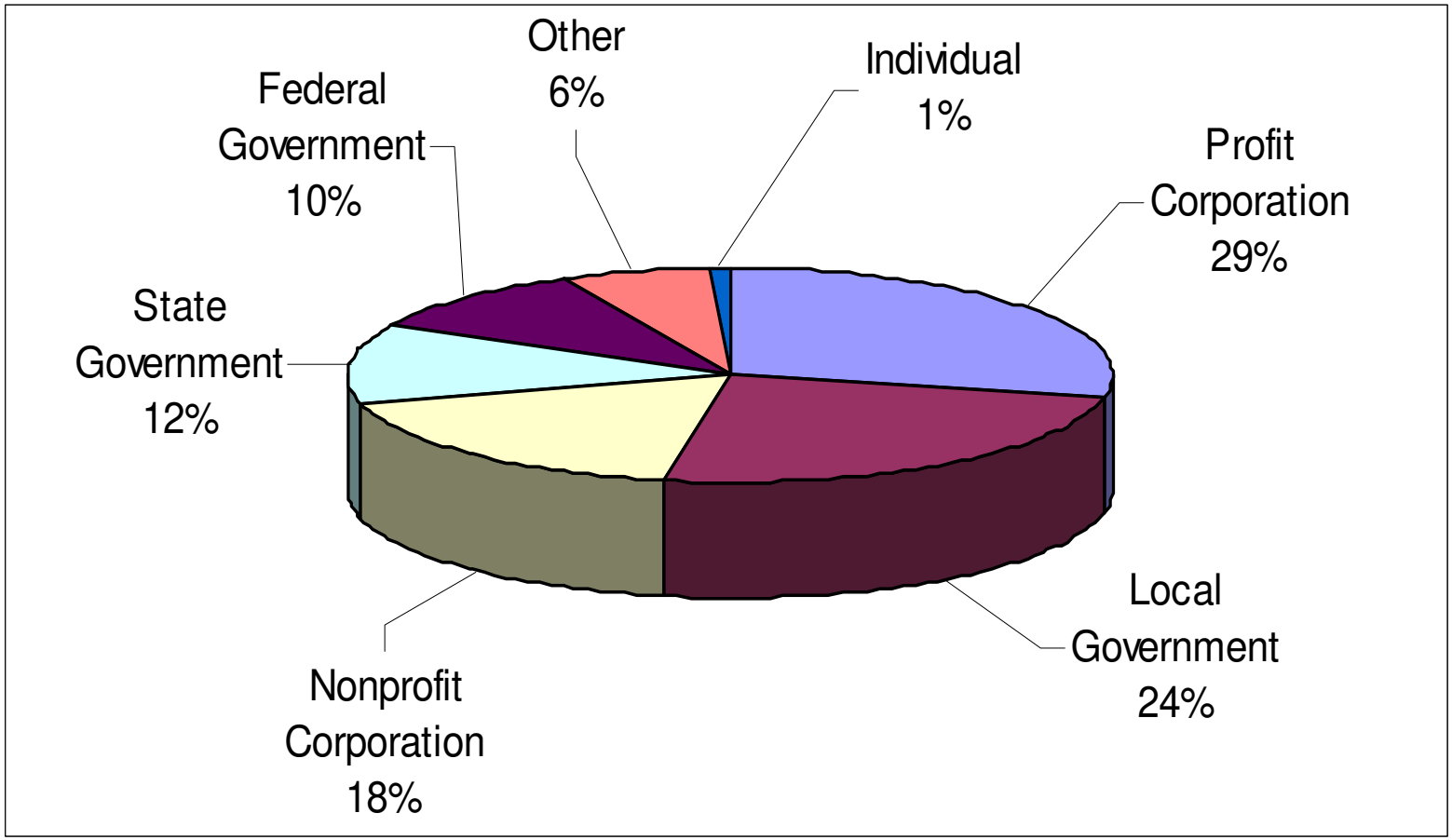
- **Registered Projects by Building Type***



*As of 11.20.03

LEED-NC™ National Reports

- Registered Projects by Owner Type*



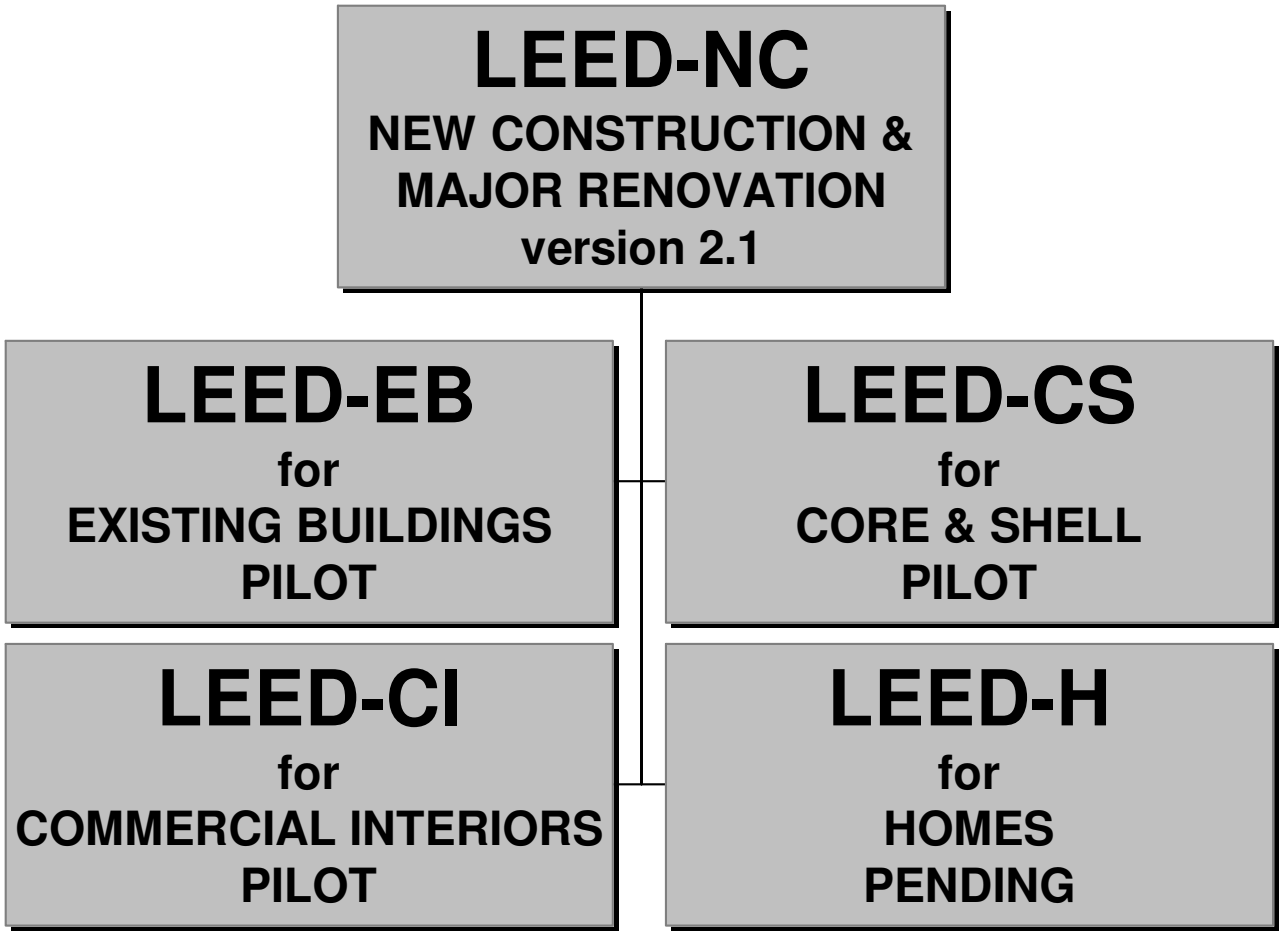
* As of 11.20.03

Leadership in Energy & Environmental Design™

A leading-edge system for designing, constructing, operating and certifying the world's greenest buildings.

USGBC's flagship rating system is LEED for New Construction and Major Renovations (LEED-NC)

LEED Classifications



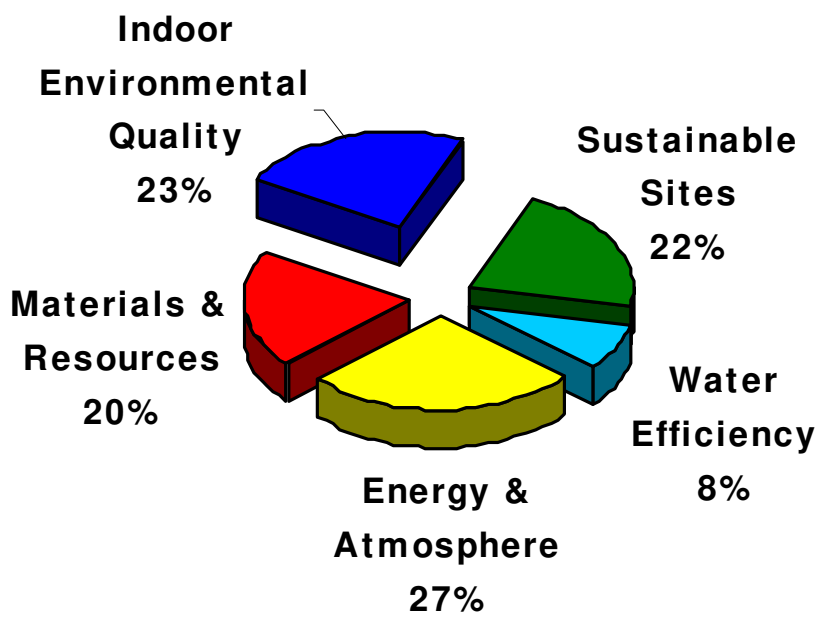
Technical Overview of LEED™

- Green building rating system, currently for commercial and institutional new construction and major renovation.
- Existing, proven technologies
- Evaluates and recognizes performance in accepted green design categories
- LEED product development includes existing buildings, interiors, multiple buildings, core & shell, and homes

Technical Overview of LEED™
(continued)

- Whole-building approach encourages and guides a collaborative, integrated design and construction process
- Optimizes environmental and economic factors
- Four levels of certification
  - LEED Certified 26 - 32 points
  - Silver Level 33 - 38 points
  - Gold Level 39 - 51 points
  - Platinum Level 52+ points (69 possible)

LEED-NC™ Point Distribution



Five LEED credit categories

Sustainable Sites - Goals

- Develop appropriate sites
- Reuse existing buildings and/or sites
- Protect natural and agricultural areas
- Reduce need for automobile use
- Protect and/or restore sites

Sustainable Sites - Credits

Credit	Point(s)
▪ Erosion & Sediment Control	Required
▪ Site Selection	1
▪ Urban Redevelopment	1
▪ Brownfield Redevelopment	1
▪ Alternative Transportation	1-4
▪ Reduced Site Disturbance	1-2
▪ Stormwater Management	1-2
▪ Landscape & Exterior Design to Reduce Heat Islands	1-2
▪ Light Pollution Reduction	1
	14 Total

Water Efficiency - Goals

- Reduce the quantity of water required for building operations
- Reduce municipal water supply and treatment burden

Water Efficiency - Credits

Credit	Point(s)
▪ Water Efficient Landscaping	1-2
▪ Innovative Wastewater Technologies	1
▪ Water Use Reduction	1-2
	5 Total

Energy & Atmosphere - Goals

- Establish energy efficiency and system performance
- Optimize energy efficiency
- Encourage renewable and alternative energy sources
- Support ozone protection protocols

Energy & Atmosphere - Credits

Credit	Point(s)
▪ Fundamental Building Systems Commissioning	Required
▪ Minimum Energy Performance	Required
▪ CFC Reduction in HVAC&R Equipment	Required
▪ Optimize Energy Performance	1-10
▪ Renewable Energy	1-3
▪ Additional Commissioning	1
▪ Ozone Depletion	1
▪ Measurement & Verification	1
▪ Green Power	1
	17 Total

Materials & Resources - Goals

- Reduce the amount of materials required
- Use materials with less environmental impact
- Reduce and manage waste

Materials & Resources - Credits

Credit	Point(s)
▪ Storage and Collection of Recyclables	Required
▪ Building Reuse	1-3
▪ Construction Waste Management	1-2
▪ Resource Reuse	1-2
▪ Recycled Content	1-2
▪ Local/Regional Materials	1-2
▪ Rapidly Renewable Materials	1
▪ Certified Wood	1
	13 Total

Indoor Environmental Quality - Goals

- Establish good indoor air quality
- Eliminate, reduce, and manage the sources of indoor pollutants
- Ensure thermal comfort and system controllability
- Provide for occupant connection to the outdoor environment

Indoor Environmental Quality - Credits

Credit	Point(s)
▪ Minimum IAQ Performance	Required
▪ Environmental Tobacco Smoke Control	Required
▪ Carbon Dioxide (CO_2) Monitoring	1
▪ Increase Ventilation Effectiveness	1
▪ Construction IAQ Management Plan	1-2
▪ Low-Emitting Materials	1-4
▪ Indoor Chemical & Pollutant Source Control	1
▪ Controllability of Systems	1-2
▪ Thermal Comfort	1-2
▪ Daylight & Views	1-2
	15 Total

Innovative Design - Goals

Provide design teams and projects the opportunity to be awarded points for:

- Exceptional performance above and beyond the standards set by the LEED Green Building Rating System.
- Innovative performance in areas not specifically addressed by the LEED Green Building Rating System.

Innovative Design - Credits

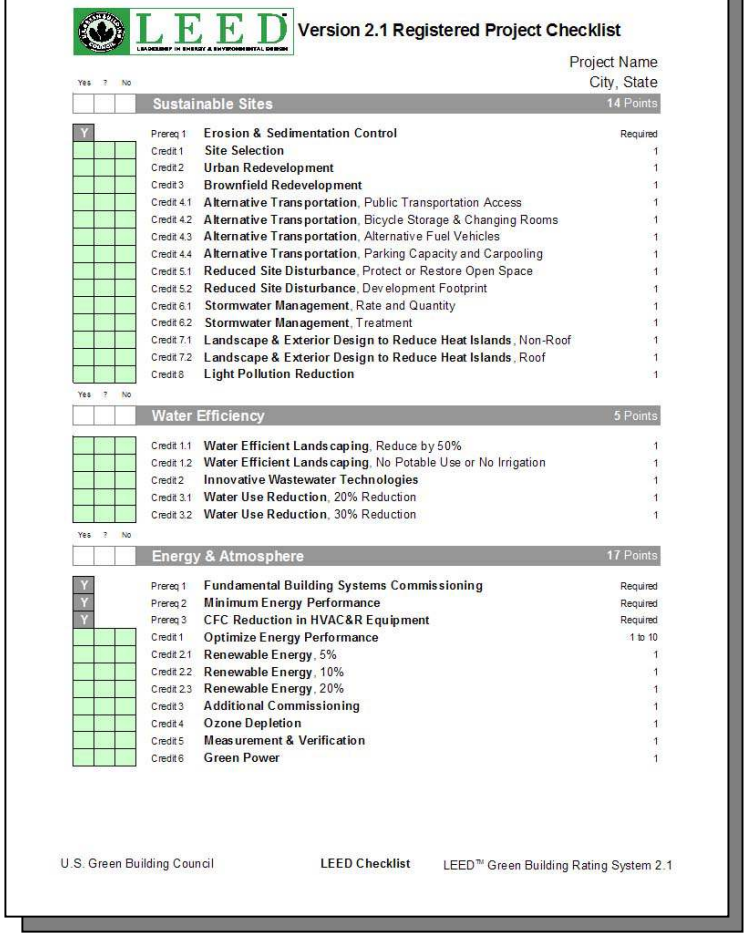
Credit	Point(s)
Innovation in Design	1-4
LEED Accredited Professional	1
	5 Total

LEED-NC™ Certification Process

A three step process :

- Step 1: Project Registration
  - LEED Letter Templates, CIR access, and on-line project listing
- Step 2: Technical Support
  - Reference Package
  - Credit Inquiries and Rulings
- Step 3: Building Certification
  - Upon documentation submittal and USGBC review

LEED v2.1 Checklist

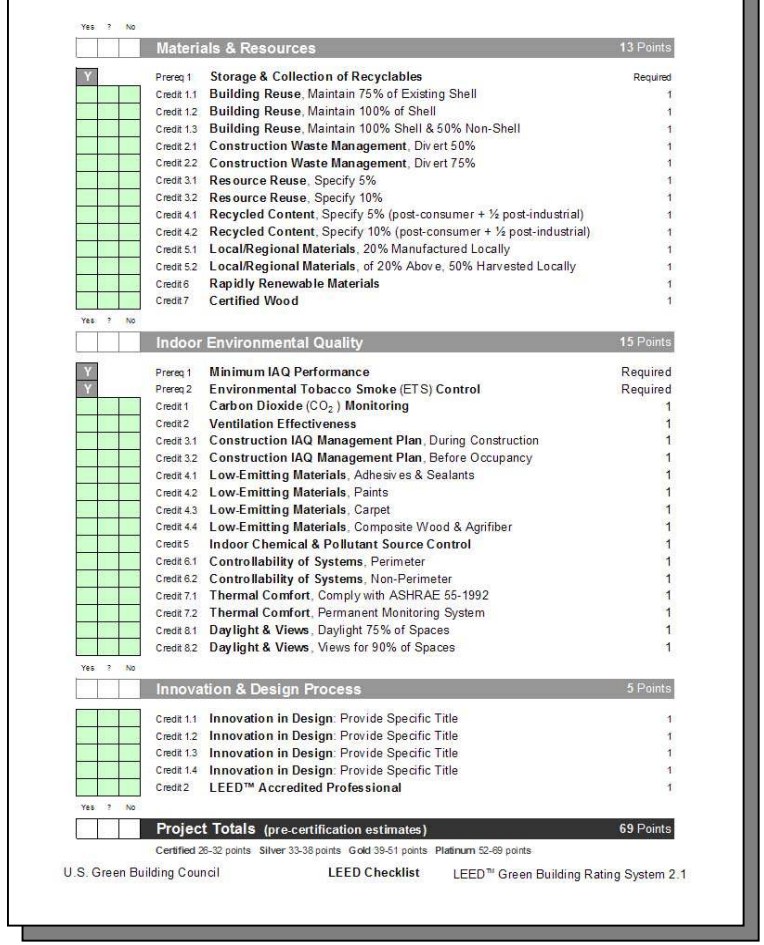


LEED Version 2.1 Registered Project Checklist

Project Name
City, State

Yes	?	No			
			Sustainable Sites	**14** Points	
Y			Prereq 1	**Erosion & Sedimentation Control**	Required
			Credit 1	**Site Selection**	1
			Credit 2	**Urban Redevelopment**	1
			Credit 3	**Brownfield Redevelopment**	1
			Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
			Credit 4.3	**Alternative Transportation**, Alternative Fuel Vehicles	1
			Credit 4.4	**Alternative Transportation**, Parking Capacity and Carpooling	1
			Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
			Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
			Credit 6.1	**Stormwater Management**, Rate and Quantity	1
			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
			Credit 8	**Light Pollution Reduction**	1
			Water Efficiency	**5** Points	
			Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
			Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
			Credit 2	**Innovative Wastewater Technologies**	1
			Credit 3.1	**Water Use Reduction**, 20% Reduction	1
			Credit 3.2	**Water Use Reduction**, 30% Reduction	1
			Energy & Atmosphere	**17** Points	
Y			Prereq 1	**Fundamental Building Systems Commissioning**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**CFC Reduction in HVAC&R Equipment**	Required
			Credit 1	**Optimize Energy Performance**	1 to 10
			Credit 2.1	**Renewable Energy**, 5%	1
			Credit 2.2	**Renewable Energy**, 10%	1
			Credit 2.3	**Renewable Energy**, 20%	1
			Credit 3	**Additional Commissioning**	1
			Credit 4	**Ozone Depletion**	1
			Credit 5	**Measurement & Verification**	1
			Credit 6	**Green Power**	1

U.S. Green Building Council **LEED Checklist** LEED™ Green Building Rating System 2.1

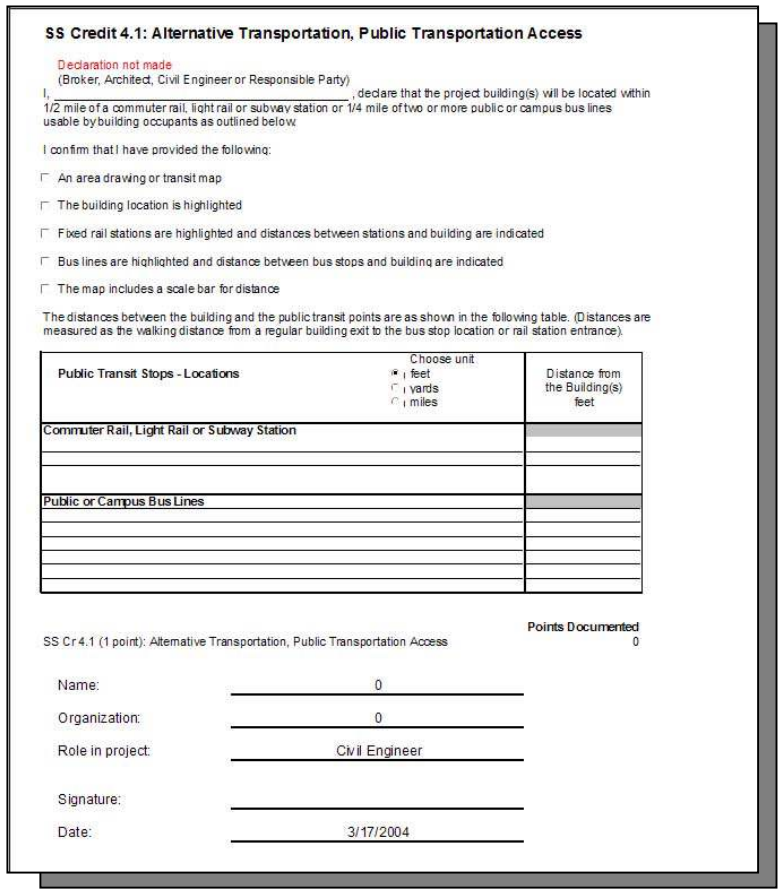


Yes	?	No			
			Materials & Resources	**13** Points	
Y			Prereq 1	**Storage & Collection of Recyclables**	Required
			Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
			Credit 1.2	**Building Reuse**, Maintain 100% of Shell	1
			Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
			Credit 2.1	**Construction Waste Management**, Divert 50%	1
			Credit 2.2	**Construction Waste Management**, Divert 75%	1
			Credit 3.1	**Resource Reuse**, Specify 5%	1
			Credit 3.2	**Resource Reuse**, Specify 10%	1
			Credit 4.1	**Recycled Content**, Specify 5% (post-consumer + ½ post-industrial)	1
			Credit 4.2	**Recycled Content**, Specify 10% (post-consumer + ½ post-industrial)	1
			Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
			Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
			Credit 6	**Rapidly Renewable Materials**	1
			Credit 7	**Certified Wood**	1
			Indoor Environmental Quality	**15** Points	
Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required
			Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
			Credit 2	**Ventilation Effectiveness**	1
			Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
			Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
			Credit 4.2	**Low-Emitting Materials**, Paints	1
			Credit 4.3	**Low-Emitting Materials**, Carpet	1
			Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber	1
			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
			Credit 6.1	**Controllability of Systems**, Perimeter	1
			Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
			Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
			Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
			Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
			Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1
			Innovation & Design Process	**5** Points	
			Credit 1.1	**Innovation in Design**: Provide Specific Title	1
			Credit 1.2	**Innovation in Design**: Provide Specific Title	1
			Credit 1.3	**Innovation in Design**: Provide Specific Title	1
			Credit 1.4	**Innovation in Design**: Provide Specific Title	1
			Credit 2	**LEED™ Accredited Professional**	1
			Project Totals (pre-certification estimates)	**69** Points	

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

U.S. Green Building Council **LEED Checklist** LEED™ Green Building Rating System 2.1

LEED Credit Template



SS Credit 4.1: Alternative Transportation, Public Transportation Access

Declaration not made
(Broker, Architect, Civil Engineer or Responsible Party)

I, _____, declare that the project building(s) will be located within 1/2 mile of a commuter rail, light rail or subway station or 1/4 mile of two or more public or campus bus lines usable by building occupants as outlined below.

I confirm that I have provided the following:

- ☐ An area drawing or transit map
- ☐ The building location is highlighted
- ☐ Fixed rail stations are highlighted and distances between stations and building are indicated
- ☐ Bus lines are highlighted and distance between bus stops and building are indicated
- ☐ The map includes a scale bar for distance

The distances between the building and the public transit points are as shown in the following table. (Distances are measured as the walking distance from a regular building exit to the bus stop location or rail station entrance).

Public Transit Stops - Locations	Choose unit: (•) feet ( ) yards ( ) miles	Distance from the Building(s) feet
Commuter Rail, Light Rail or Subway Station		
Public or Campus Bus Lines		

	Points Documented
SS Cr 4.1 (1 point): Alternative Transportation, Public Transportation Access	0

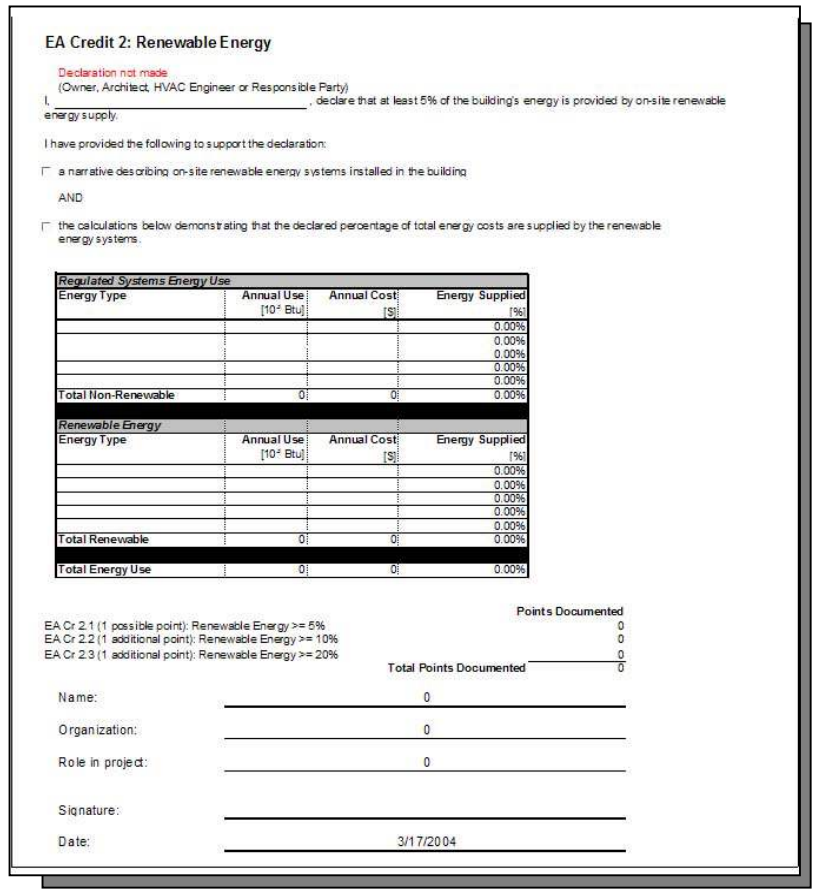
Name: 0

Organization: 0

Role in project: Civil Engineer

Signature: _____

Date: 3/17/2004



EA Credit 2: Renewable Energy

Declaration not made
(Owner, Architect, HVAC Engineer or Responsible Party)

I, _____, declare that at least 5% of the building's energy is provided by on-site renewable energy supply.

I have provided the following to support the declaration:

- ☐ a narrative describing on-site renewable energy systems installed in the building

AND

- ☐ the calculations below demonstrating that the declared percentage of total energy costs are supplied by the renewable energy systems.

Regulated Systems Energy Use			
Energy Type	Annual Use [10^3 Btu]	Annual Cost [$]	Energy Supplied [%]
			0.00%
			0.00%
			0.00%
			0.00%
			0.00%
Total Non-Renewable	0	0	0.00%
Renewable Energy			
Energy Type	Annual Use [10^3 Btu]	Annual Cost [$]	Energy Supplied [%]
			0.00%
			0.00%
			0.00%
			0.00%
			0.00%
Total Renewable	0	0	0.00%
Total Energy Use	0	0	0.00%

	Points Documented
EA Cr 2.1 (1 possible point): Renewable Energy >= 5%	0
EA Cr 2.2 (1 additional point): Renewable Energy >= 10%	0
EA Cr 2.3 (1 additional point): Renewable Energy >= 20%	0
Total Points Documented	0

Name: 0

Organization: 0

Role in project: 0

Signature: _____

Date: 3/17/2004

LEED™ Resources

- LEED Green Building Rating System
- Training Workshop
- Reference Manual
- Professional Accreditation
- Case Studies
- Credit Rulings
- Local chapter – North Texas Chapter
- Website - www.usgbc.org

North Texas Chapter

To become a member:

- Goto www.usgbc.org
- Click on the “Chapters” tab
- Scroll down to “North Texas Chapter”
- Click on “Join this Chapter”

For more information
please visit
www.usgbc.org