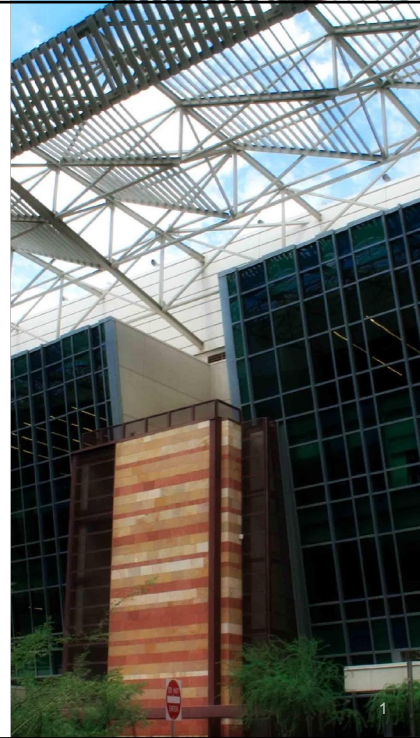


# LEED V4 TRAINING PROGRAM

## INTRODUCTION



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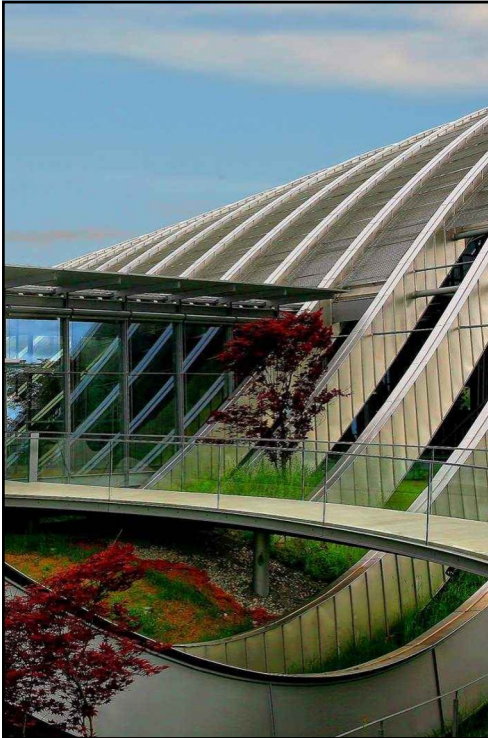
## TRAINING PROGRAM

Time		Topic		Trainer	
09.00 - 09.10		Introduction		Murat DOĞRU	LEED AP BD+C, Envision SP
09.10 - 10.00	LEED	What is LEED? Green Building Concepts	Questions & Answers	Murat DOĞRU	LEED AP BD+C, Envision SP
10.00 - 10.10		Tea, Coffee Break			
10.10 - 10.50	WE	Water Efficiency	Questions & Answers	Nurdan YILDIRIM	Prof.Dr. Mechanical Engineer
10.50 - 11.00		Tea, Coffee Break			
11.10 - 11.50	LT	Location and Transportation	Questions & Answers	Murat DOĞRU	LEED AP BD+C, Envision SP
11.50 - 12.30	SS	Sustainable Sites		Murat DOĞRU	LEED AP BD+C, Envision SP
12.30 - 13.30		Lunch Break			
13.00 - 14.15	IEQ	Indoor Environment Quality	Questions & Answers	Nurdan YILDIRIM	Prof.Dr. Mechanical Engineer
14.15 - 14.30		Tea, Coffee Break			
14.30 - 15.20	EA	Energy and Atmosphere	Questions & Answers	Nurdan YILDIRIM	Prof.Dr. Mechanical Engineer
15.20-16.20	MR	Materials and Resources	Questions & Answers	Murat DOĞRU	LEED AP BD+C, Envision SP
16.20 - 16.30		Tea, Coffee Break			
16.30 - 17.15	ID	Innovation in Design	Questions & Answers	Murat DOĞRU	LEED AP BD+C, Envision SP
17.15 - 17.30	RP	Regional Priority		Murat DOĞRU	LEED AP BD+C, Envision SP

2

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## WHAT IS A GREEN BUILDING?

- It is a design and construction practice that, by adhering to specific standards, causes less harm to its occupants and the environment compared to conventional buildings.
- Design and construction practices that meets specified standards, resolving much of the negative impact of buildings on their occupants and on the environment.

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## HIGH PERFORMANCE GREEN BUILDINGS

- The most successful environmental movement in the world.
- It includes producers, builders, and designers.
- Market compatible, conscious-based and ethical.
- The only solution produced by the construction industry to reverse climate change.
- It enhances the quality of life for people.
- The best social responsibility project for every institution due to the design and construction of buildings with minimal environmental impact.
- It provides a beautiful image and very high promotional and brand value to its investors. Thus, it contributes to the firm's brand.
- It protects the national economy.

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## GREEN BUILDING FEATURES

- A building that makes the most efficient use of land,
- Uses materials that are convertible and recyclable,
- Turns to renewable energy sources,
- Consumes fossil fuels as little as possible,
- Maximizes the use of daylight,
- Monitors indoor air quality,
- Saves on heating, cooling, and lighting expenses,
- Utilizes gray water, emphasizes rainwater collection and treatment,
- Promotes solid waste management, and
- Maximizes roof, wall, and window insulation can be referred to as green buildings.

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## WHY GREEN BUILDING?

- It offers ethical and practical sustainable construction techniques that will prevent resource consumption and the damage to the environment throughout the life of the building and its components.
- When Life Cycle Cost Assessment (LCC) is performed, it proves to be much more economical compared to a standard building.
- High Indoor Environmental Quality (IEQ):
- Building-Related Illnesses (BRI)
- Multiple Chemical Sensitivity (MCS)
- Sick Building Syndrome (SBS)

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### TRADITIONAL BUILDING DESIGN - NEGATIVE ASPECTS AND LOSSES OF CONSTRUCTION PRACTICE

- Lack of a specifically defined roadmap or an incomplete roadmap or non-compliance with the roadmap;
- Failure to fully understand and articulate the project goals and the main desires of the project owner;
- The emergence of many errors and deficiencies due to communication problems in processes, which negatively affect design performance;
- Conflicts arising between project teams/stakeholders;
- The inability to reach any conclusions at the end of design meetings due to improper planning of meeting structure and flow is another negative aspect.
- Making individual decisions without any communication between project groups.

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### BENEFITS OF INTEGRATED DESIGN PROCESS

- Formation of the project team with the right scope;
- Clear determination of design purposes and objectives;
- Increase in continuous development and optimization in design;
- Ensuring that cost management and the concept of OPTIMUM COST are taken into account by the entire project team from the very beginning of the project;
- In green building projects, supporting the environmentally sensitive design process with preliminary studies;
- Evaluation of returns from these environmental studies conducted before starting the detailed design process, and working on alternatives if necessary;
- Ensuring the participation of the entire project team in the planning and design process;
- Conducting workshops and meetings where primary topics that need to be overcome, such as the direction the design will take, necessary measures to be taken, design decisions, constraints, obstacles, regulations, standards, challenges, performance objectives, etc., are discussed through brainstorming with relevant project participants;
- Obtaining the correct design outputs at the right time.

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## SUSTAINABLE DEVELOPMENT?

Economics-Environment-Social Responsibility-  
Triple Bottom Line

Triple Bottom Line:

Economy

Environment

Social Responsibility

The definition of Sustainable Development made by the Brundtland Commission (United Nations Commission on Environment and Development) in 1987:

It is the use of all resources without risking the needs of future generations.

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## VOLUNTEER APPLIED CERTIFICATION SYSTEMS

- BEES (Building for Environmental and Economic Sustainability)
- BREEAM (Building Research Establishment Environmental Assessment Method)-British
- CASBEE (Japanese)
- DGNB (German)
- ECOPROFILE (For existing offices)
- GREENSTAR (Australian)
- LEED® (American)
- LCAid (Based on Life Cycle Analysis)

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## WHAT IS LEED?

- Leadership Energy Environmental Design
- It can be defined as a rating system that includes a third-party certification process that allows for a measurable reference in revealing the environmental impacts of projects at the building, neighborhood, and even city level, and their sensitivity to natural resource conservation.
- LEED Certification
- Is a system that is Voluntary, Common Sense-Based, and Market-Driven.

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## WHAT IS LEED?

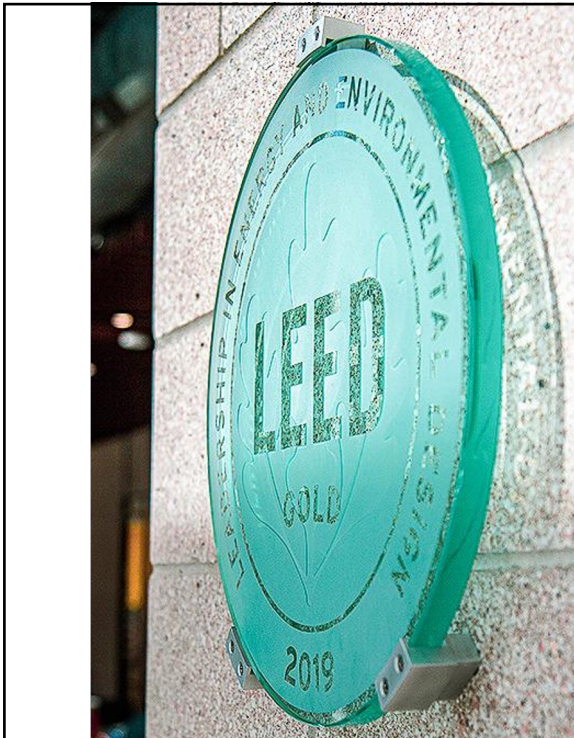
- Initially supported by tax and credit initiatives provided by governments in the countries where it is used, LEED® developed as a system awarded to new buildings following applications examined by experts.
- Later on, it diversified into specific areas such as existing buildings, industrial interiors, neighborhood planning, and hospitals. Different criteria were established for each certification system under LEED.

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## LEED SYSTEM

- NC&MR: New Construction & Major Renovations
- EBOM: Existing Buildings: Operations & Maintenance
- CI: Commercial Interiors
- CS: Core & Shell
- Schools
- Retail
- Healthcare
- Homes
- ND: Neighborhood Development
- Data Centers
- Hospitality (Hotels)

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## NEW CONSTRUCTION AND MAJOR RENOVATIONS

- Includes newly constructed buildings and major restorations.
- In this system, residential buildings with 4 floors or more are also certified.
- Renovations that include the ventilation systems of existing buildings are considered significant renovations. They can apply for new building certification.
- The goal is to achieve the highest performance in newly developed commercial and residential projects.

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## EXISTING BUILDINGS

- Existing buildings can also obtain LEED certification. Today, all renowned buildings in the world are receiving LEED for Existing Buildings certification.
- LEED® for Existing Buildings is a certification system developed for existing buildings. In this certification system, different standards are sought for existing structures.
- By obtaining LEED for Existing Buildings certification, existing buildings can achieve 13% lower maintenance costs, 26% less electricity consumption, 27% higher building user and customer satisfaction, and 33% lower carbon emissions.

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## COMMERCIAL INTERIORS

- Provides interior design criteria for the residents of the building.
- It means the certification of interior spaces such as offices or management units.
- As a result, a portion of an existing building can obtain certification.
- However, if the building does not have green building features, it is quite difficult to obtain certification for part of it.

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## CORE AND SHELL

- In this certification system aimed at the core and shell of a building, builders create and sell or lease the building's core and shell.
- This certification system also includes decisions related to operations.
- However, if the building does not possess green building features, it is quite difficult to obtain a Core and Shell certification.

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## SCHOOLS

- It aims to enhance the green performance of schools and educational areas.
- LEED® for Schools is a certification system developed for educational institutions and schools. Different standards are sought for schools in this certification system.
- Especially, LEED for Schools certifications are recommended for multiple buildings and campuses. Walkability, bicycle accessibility, and improved public transportation standards ensure that students receive education in environments that are much more environmentally conscious and healthy.
- Acoustic standards, utilization of daylight, selection of certified school furniture and equipment, and a series of other different standards are provided in the LEED for Schools certification for students' educational environments. Through these criteria, healthy and efficient educational environments are built.
- To apply for the School Certification, the school must operate for a period of 1 year.

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## RETAIL

The Retail Certification for Chain Stores is a system developed specifically for retail service-providing stores and businesses that are chains. Examples of such uses may include:

Shopping malls  
Bank branches  
Fast food restaurants and stores  
Clothing stores  
Computer and electronics stores  
Book, magazine, music-movie CD, DVD, and similar sales stores

Stores today are places where a significant amount of time is spent and are important in terms of energy consumption. Stores need to be at a contemporary level in terms of energy, economy, and health. Stores and chain stores document that they are green and environmentally conscious with LEED® Retail certifications. This way, the prestige and brand value of companies operating stores increase both nationally and internationally.

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## HEALTHCARE

- LEED® Healthcare - Hospital Buildings Certification is a certification system developed considering the needs of healthcare organizations and the aspects they need to be sensitive to compared to other buildings.
- LEED Healthcare - Hospital Buildings Certification specifically takes into account the health standards that hospital buildings must adhere to. However, like other LEED® certification systems, it also carries similar standards in areas such as material selection, energy, and water consumption.
- LEED Healthcare - Hospital Buildings Certification is particularly necessary for international healthcare services and health tourism. The reason for this is that organizations referring patients from abroad have started to seek LEED Healthcare - Hospital certification in hospitals in recent years.
- The LEED Healthcare certification process for hospitals has begun to gain demand in our country, especially with the construction of new large hospitals.

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## HOMES - RESIDENTIAL BUILDINGS

- This is a certification system developed for low-rise residential buildings with fewer than 4 floors.
- The certification and control phases of this system for residential buildings differ from other systems.
- In this system, certain tests for residential buildings are mandatory.

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## NEIGHBORHOOD DEVELOPMENT

- It is a certification system that includes criteria for urban planning, smart growth, and green buildings aimed at neighborhood development.
- It has a significant impact on the development of neighborhood units in accordance with urban and green design principles.
- Since 2010, pilot projects have been completed and the certification process has begun.

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Credit 1	Integrative Process	Possible Points: 1
Credit 1	LEED for Neighborhood Development Location	Possible Points: 16
Credit 1	Sensitive Land Protection	1
Credit 1	High Priority Site	2
Credit 4	Surrounding Density and Diverse Uses	5
Credit 5	Access to Quality Transit	5
Credit 6	Bicycle Facilities	1
Credit 7	Reduced Parking Footprint	1
Credit 8	Green Vehicle	1
Credit 1	Construction Activity Pollution Prevention	Possible Points: 10
Credit 1	Site Assessment	Required
Credit 2	Site Development—Protect or Restore Habitat	2
Credit 3	Open Space	1
Credit 4	Rainwater Management	3
Credit 5	Heat Island Reduction	2
Credit 6	Light Pollution Reduction	1
Credit 1	Outdoor Water Use Reduction	Possible Points: 15
Credit 1	Outdoor Water Use Reduction	Required
Credit 2	Building-Level Water Metering	Required
Credit 1	Outdoor Water Use Reduction	2
Credit 2	Indoor Water Use Reduction	4
Credit 3	Cooling Tower Water Use	2
Credit 4	Water Metering	1
Credit 1	Energy and Atmosphere	Possible Points: 35
Credit 1	Fundamental Commissioning and Verification	Required
Credit 2	Minimum Energy Performance	Required
Credit 3	Building-Level Energy Metering	Required
Credit 4	Fundamental Refrigerant Management	Required
Credit 1	Enhanced Commissioning	6
Credit 2	Optimize Energy Performance	18
Credit 3	Advanced Energy Metering	1
Credit 4	Demand Response	1
Credit 5	Renewable Energy Production	2
Credit 6	Enhanced Refrigerant Management	1
Credit 7	Green Power and Carbon Offsets	2
Credit 1	Materials and Resources	Possible Points: 13
Credit 1	Storage and Collection of Recyclables	Required
Credit 2	Construction and Demolition Waste Management Planning	Required
Credit 1	Building Life-Cycle Impact Reduction	5
Credit 2	Building Product Disclosure and Optimization—Environmental Product Declarations	2
Credit 3	Building Product Disclosure and Optimization—Sourcing of Raw Materials	2
Credit 4	Building Product Disclosure and Optimization—Material Ingredients	2
Credit 5	Construction and Demolition Waste Management	2
Credit 1	Indoor Environmental Quality	Possible Points: 16
Credit 1	Minimum Indoor Air Quality Performance	Required
Credit 2	Environmental Tobacco Smoke Control	Required
Credit 1	Enhanced Indoor Air Quality Strategies	2
Credit 2	Low-Emitting Materials	3
Credit 3	Construction Indoor Air Quality Management Plan	1
Credit 4	Indoor Air Quality Assessment	2
Credit 5	Thermal Comfort	1
Credit 6	Interior Lighting	2
Credit 7	Daylight	3
Credit 8	Quality Views	1
Credit 9	Acoustic Performance	1
Credit 1	Innovation	Possible Points: 6
Credit 1	Innovation	5
Credit 2	LEED Accredited Professional	1
Credit 1	Regional Priority	Possible Points: 4
Credit 1	Regional Priority: Specific Credit	1
Credit 2	Regional Priority: Specific Credit	1
Credit 3	Regional Priority: Specific Credit	1
Credit 4	Regional Priority: Specific Credit	1
Credit 1	Total	Possible Points: 110

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## SCORECARD



- On the right side, there is the scorecard for the LEED Green Building Rating System v4.
- The scorecard summarizes all the prerequisites and credit categories required for certification along with their points.



# SCORES

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- in the v3 2009 and v4 2014 systems:
- 40-49 Points Certificate
- 50-59 Points Silver
- 60-79 Points Gold
- 80+ Points Platinum



CERTIFIED

40-49 Points



SILVER

50-59 Points



GOLD

60-79 Points



PLATINUM

80+ Points

25

# LEED Certifications

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CERTIFICATE

40+ Points



SILVER

50-59 Points



GOLD

60-79 Points



PLATINUM

80-110 Points


26



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## CREDIT WEIGHTS HOW ARE THEY DETERMINED?

1. Credit weights are given based on 13 different impacts:
2. Climate Change
3. Indoor Environmental Quality
4. Resource Consumption
5. Human Health
6. Water Resources
7. Cancer Impact
8. Ecotoxicological Effect
9. Eutrophication
10. Biodiversity Change
11. Non-Cancer Health Problems
12. Smoke-Fog
13. Ozone Layer Depletion
14. Acidification

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## IMPACT CATEGORIES

Impact Categories	Weighted Impact Categories
CLIMATE CHANGE	CLIMATE CHANGE
INDOOR ENVIRONMENTAL QUALITY	INDOOR ENVIRONMENTAL QUALITY
RESOURCE DEPLETION	RESOURCE DEPLETION
HUMAN HEALTH CRITERIA	HUMAN HEALTH CRITERIA
WATER INTAKE	WATER INTAKE
HUMAN HEALTH-CANCEROUS	HUMAN HEALTH-CANCEROUS
ECOTOXICITY	ECOTOXICITY
EUTROPHICATION	EUTROPHICATION
HABITAT ALTERATION	HABITAT ALTERATION
HUMAN HEALTH-NONCANCEROUS	HUMAN HEALTH-NONCANCEROUS
SMOG FORMATION	SMOG FORMATION
OZONE DEPLETION	OZONE DEPLETION
ACIDIFICATION	ACIDIFICATION

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## REGIONAL POINTS

- Local points are intended to prioritize and weigh LEED® credits according to local priorities. If points are obtained from certain credit categories, 4 points are awarded from the RP.
- A total of 4 points can be obtained from these 6 credits.

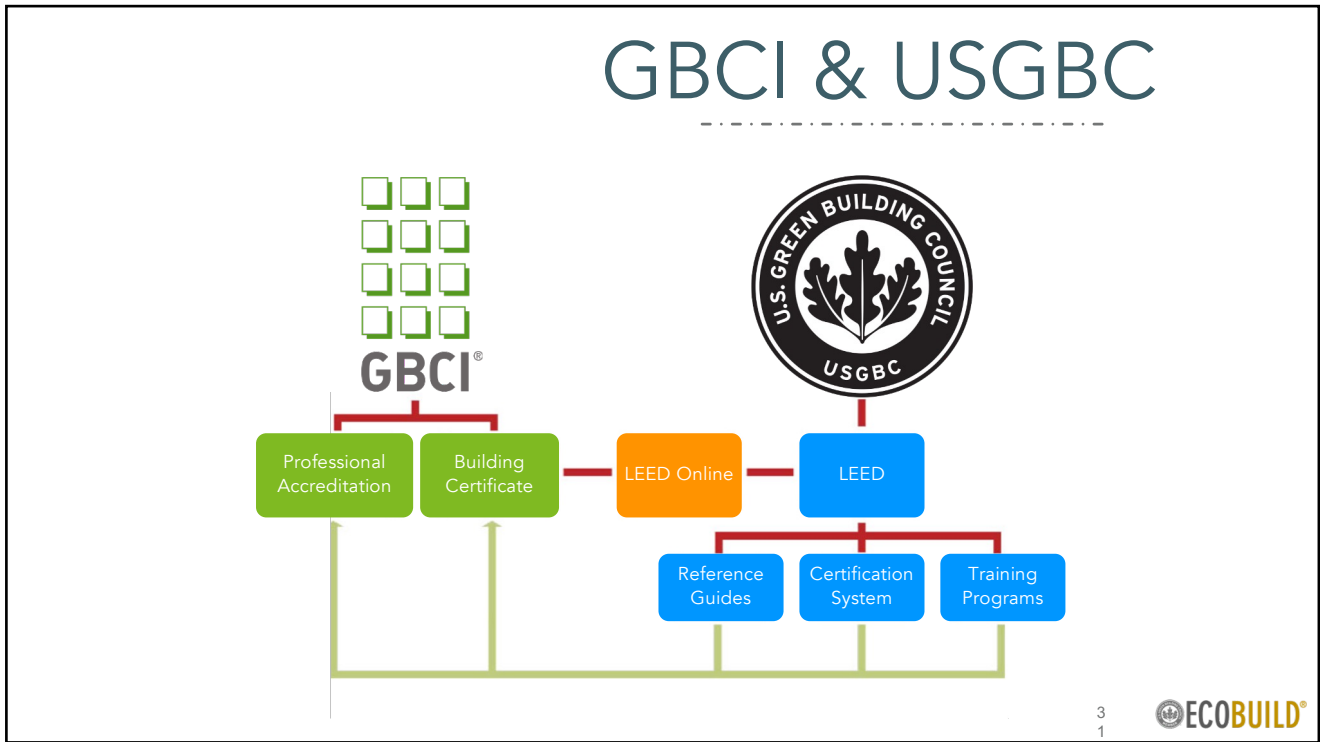
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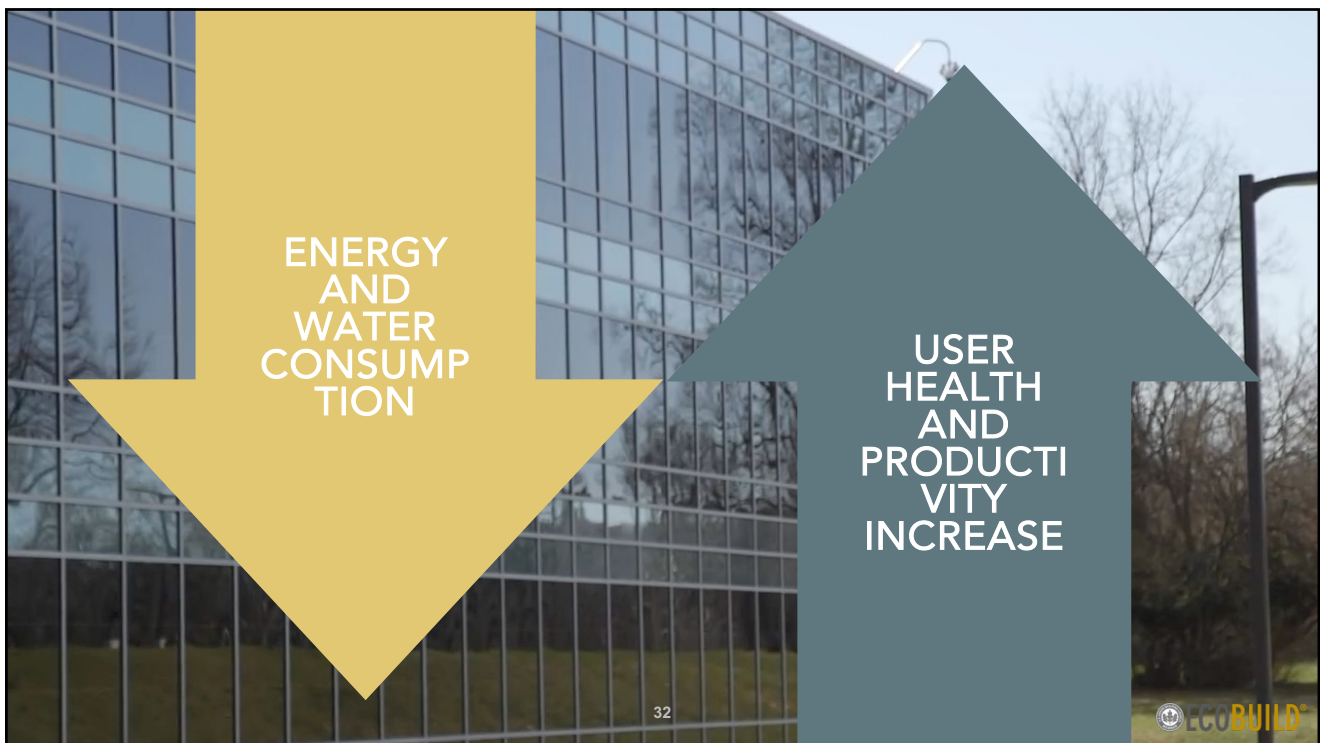
## USGBC System

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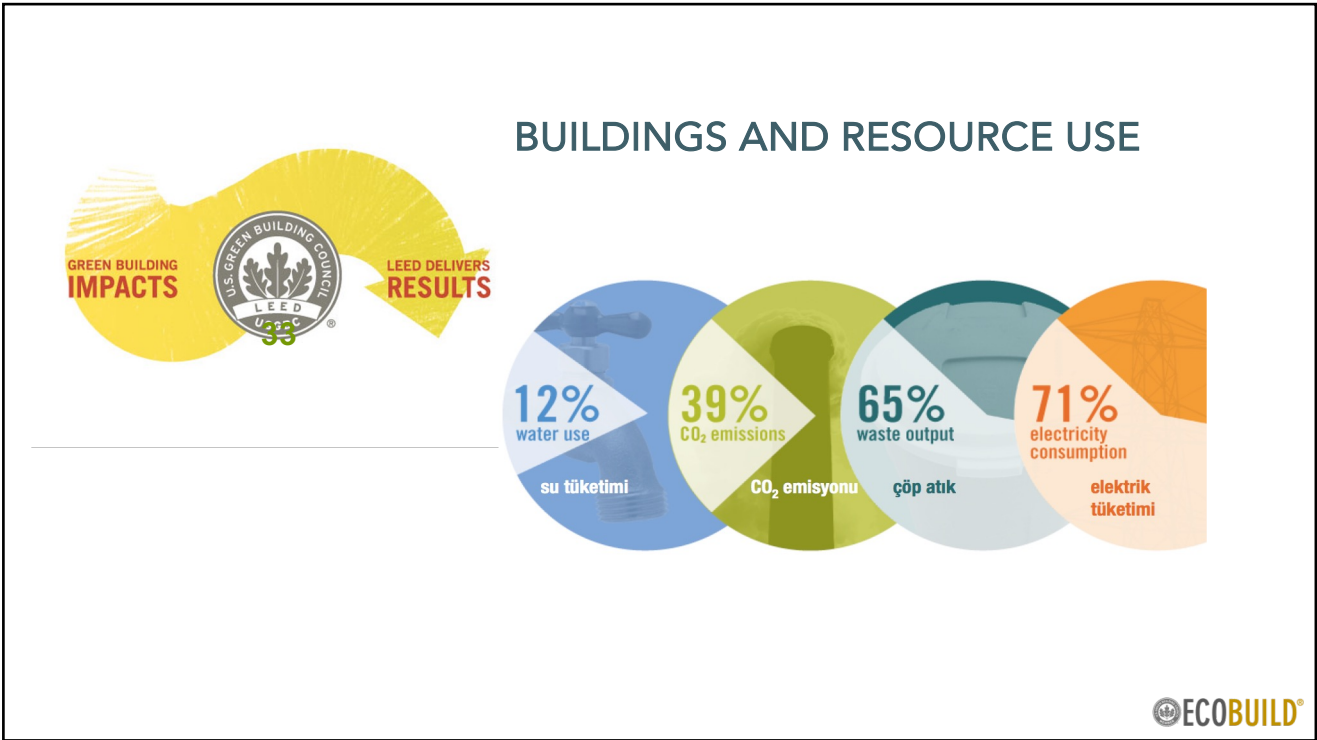


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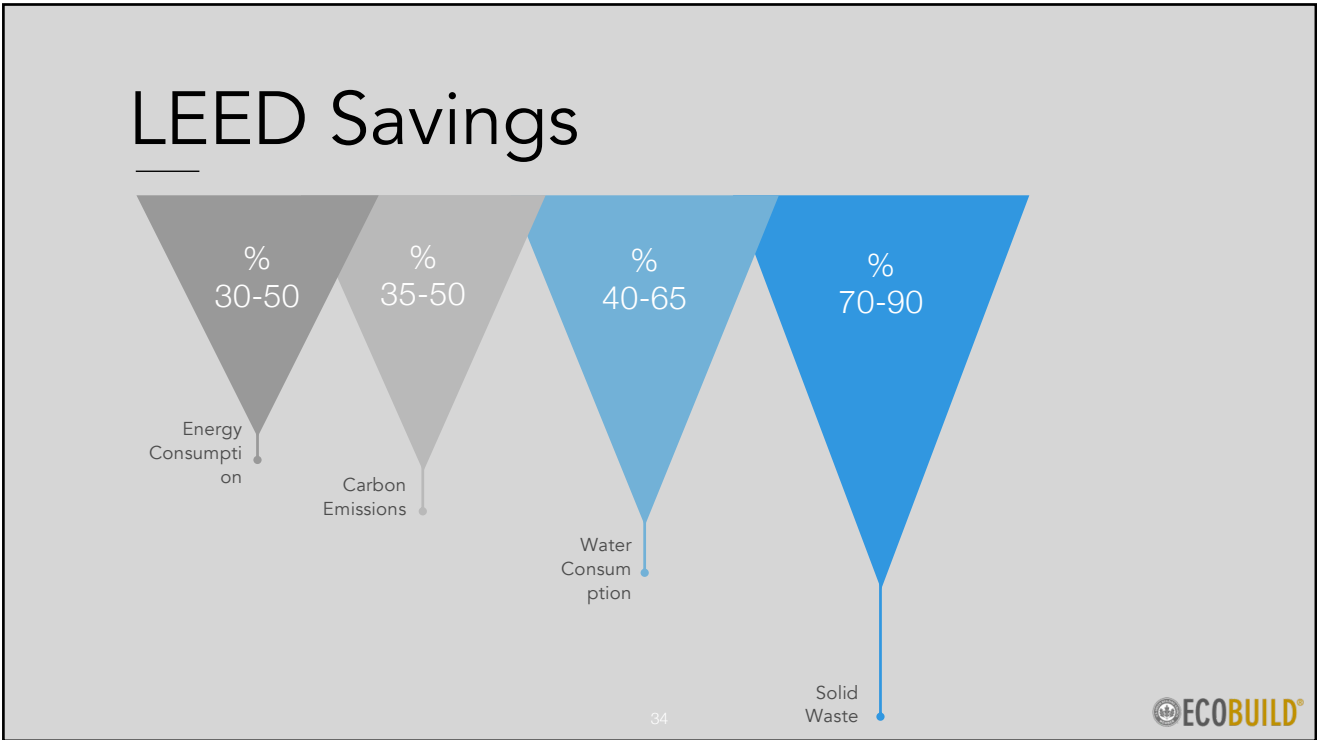


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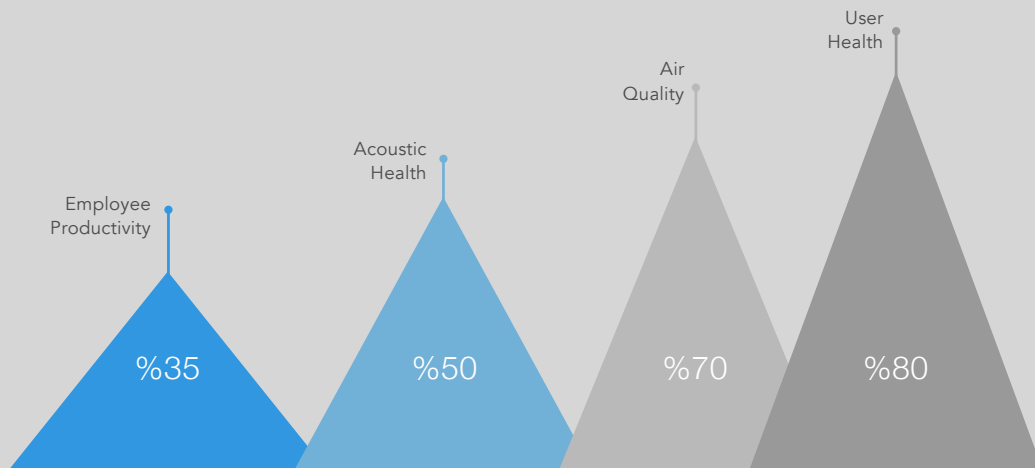


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# LEED Benefits



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## WORKING METHODS IMPROVE IN LEED® CERTIFIED BUILDINGS

- Reduction in student absenteeism and increase in their success
- Reduction of Employer Responsibilities
- Better job applications
- Improvement in employee morale
- Faster discharge times for patients
- Increase in employee productivity

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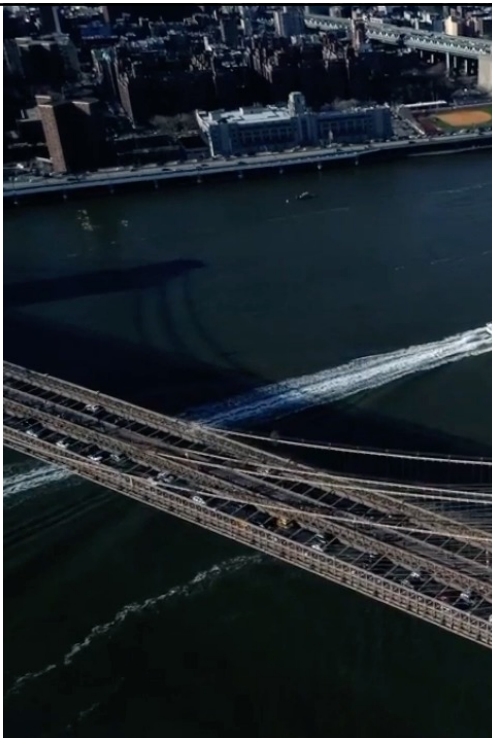


## MEN EXPLAINS THE VALUE OF LIVING IN A GREEN BUILDING AS FOLLOWS

- Less energy consumption
- Increased production
- Great benefits to health
- Positive marketing and promotion
- Increased overall environmental benefits
- Reduction of depression and stress

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## ECONOMIC BENEFITS

- 
- Competitive initial cost: Integrated design and interdisciplinary work also provide a technological synergy that leads to low costs and high returns.
  - Reduction in operational expenses
  - Optimization of lifetime building economic performance
  - Increase in building value
  - Marketing advantage - high rental fees
  - Progress in risk management

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## WHAT DOES LEED NOT DO?

- LEED® is not a certification for products.
- It does not impose limits on the use of any material or product by manufacturers, except for certain materials under country standards.
- It does not set a list of materials to be used in all projects.
- It does not recommend the same solutions for every building.
- It does not replace building codes or regulations by setting minimum standards.

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## WHAT IS THE LEED SYSTEM?



- It is not related to the product,
- It is not related to the system,
- It is an approach that encompasses the entire building and integrated design.

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## LEED® V4 INNOVATIONS

- In general, the credits remained the same but were revised according to new standards.
- References were made to 2010 instead of ASHRAE 2007.
- 20% water savings became mandatory.
- The points between different systems were made more integrated.
- Some common points of the systems were separated.
- The request for credit interpretations and the rules became a requirement.

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## LEED® V4 MINIMUM REQUIREMENTS?

- Must comply with current Environmental Laws.
- It must be a designated, permanent project. Prefabricated (portable structures/containers) are not allowed.
- The entire building must be considered. (Excluding CI)
- There must be a site land boundary.
- The site must be owned by the LEED project owner.
- Energy and water data must comply with the 5-year reporting rule.
- The gross enclosed area must be at least 2% of the lot.
- The building must serve at least 1 person.
- Must comply with minimum area criteria:
  - NC, C&S, Schools (at least 1000 ft<sup>2</sup> = 93 m<sup>2</sup>)
  - CI (at least 250 ft<sup>2</sup> = 22 m<sup>2</sup>)

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## LEED® V4 POINTS SYSTEM

	NEW BUILDING	CORE SHELL	SCHOOLS
SS Location & Linkages	26	28	24
SS Sustainable Sites	26	28	24
WE Water Efficiency	10	10	11
EA Energy and Atmosphere	35	37	33
MR Materials and Resources	14	13	13
IEQ Indoor Environmental Quality	15	12	19
ID Innovation in Design	6	6	6
RP Regional Priority	4	4	4
<b>Total Scores</b>	<b>110</b>	<b>110</b>	<b>110</b>

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## LEED V4 CREDIT INTERPRETATION REQUESTS "CIR"

- What do you do if you have a question about a credit after registering the project?
- LEED® Online Credit Interpretation Request - CIR
- The responded CIR is announced for everyone to see.
- A fee of \$220 is charged for each new CIR question.
- There is a response time of 2-5 weeks.
- CIR is explanatory, it is not for credit or document changes.

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# SAMPLE "CIR"

- A project team will ensure individual thermal comfort conditions using air diffusers.
- If the air diffuser is not mentioned in the credit.
- Step 1: Consult the reference book.
- Step 2: Check if there is a similar CIR.
- Step 3: Contact customer service to learn whether they can obtain the score.
- As a last resort, apply for a CIR.

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## LEED Process



**LEED Process Flowchart:**

- Decide to obtain LEED Certification and build a green building
- Start working with your LEED Consultant for your green building
- Let's submit your LEED Certification application together
- ECO-Charrette: Let's define your green building project goals with your integrated project team
- Pre-Evaluation: Let's conduct the preliminary energy modeling and evaluation of your project
- Let's create and submit your LEED application to the GBCI
- Build your green building according to our LEED Certification goals. Your consultant should ensure and document that your project meets the LEED requirements
- Have your LEED Consultant initiate your LEED review at the end of construction and manage your entire review process
- PROUD OWNER of a **HAPPY, HEALTHY LEED CERTIFIED PROJECT**
- Quality for LEED Certification.



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## SPLIT CERTIFICATION

- It is applied during the design phase.
- It is ideal for projects aiming for LEED® Certification at the beginning of the work.
- If there is a problem in obtaining the targeted points, the project team will have time to resolve this issue.
- Early and frequent documentation is required.

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## COMBINED CERTIFICATION

- Pre-review
- Pre-review answers
- Response to pre-review
- Final review
- Acceptance or appeal
- Appeal (\$500-800)

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## DOES COST INCREASE WITH LEED?

- There may be an increase in upfront costs, especially in countries where green design and construction practices are newly adapted compared to standard buildings.
- Construction costs may increase based on the understanding of construction quality.
- Globally, this rate is between 0-1% for high-standard projects.

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## DOES COST INCREASE WITH LEED?

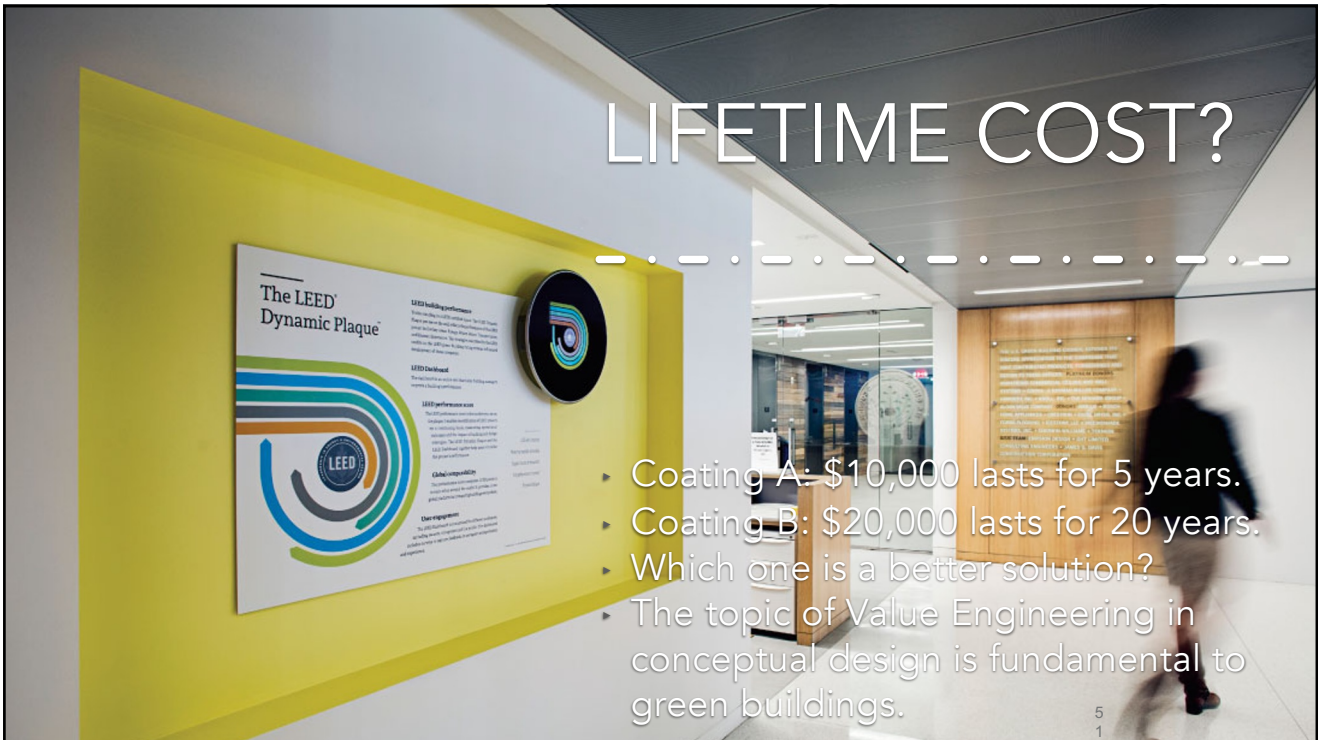
- Green Parameters of the Building:
- Costs of renewable energy facilities (in countries without government incentives)
- Effective use of water (measurement and fixtures)
- Costs associated with green materials. (for example, FSC certified wood)
- Green roofs, selection of white goods with A rating
- Increase in the quality of ventilation
- Individual lighting controls
- Individual thermal comfort controls

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# LIFETIME COST?



- Coating A: \$10,000 lasts for 5 years.
- Coating B: \$20,000 lasts for 20 years.
- Which one is a better solution?
- The topic of Value Engineering in conceptual design is fundamental to green buildings.

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# PLANNING?



- The most appropriate time to decide to undertake a LEED-certified project is during the period of land/plot selection.
- The architect should have made the decision for the project to be a green building while shaking hands with the investor.
- The project team selects the LEED coordinator.
- The project team chooses the firm that will provide LEED consultancy.
- The project is registered with USGBC.
- The LEED Consultant prepares the ECO-Charette agenda and the scorecard is filled out. The process begins.

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# PROJECT REGISTRATION?


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- Which system will I register in?
- Is the project confidential?
- What is the address of the project?
- Information about the company and project team that entered the project online.
- Information about the project owner.
- Project details.
- For more information:  
[leedinfo@usgbc.org](mailto:leedinfo@usgbc.org)

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# PROJECT REGISTRATION?

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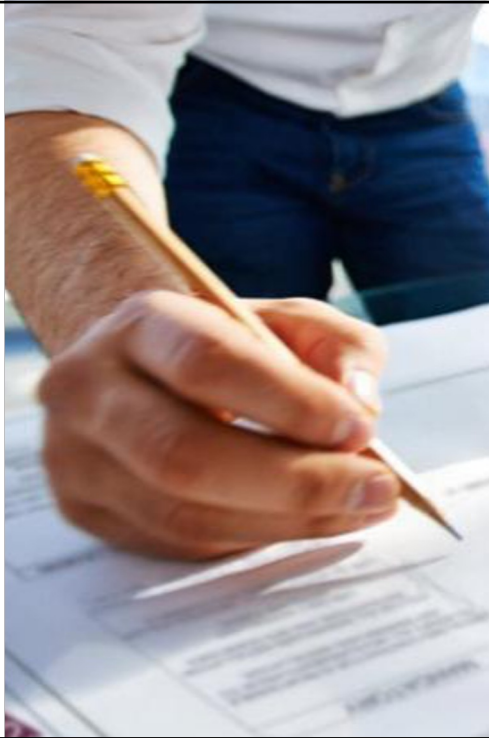
- Site user account
- Project Access Code
- LEED Scorecard filling
- Credit Status
- Filling out Original Forms
- Performance criteria will be uploaded as received from the project team.
- Review Commands

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## LEED EXPERTISE?

- ▶ GREEN ASSOCIATE: General information related to LEED, not specific expertise. A candidate suitable for working on a LEED certified project.
- ▶ LEED AP+: A test that requires knowledge of details and regulations after the Green Associate exam. This test can be taken by individuals who have worked on LEED projects.
- ▶ LEED AP Fellow: Awarded by election to those who have worked on many projects in the promotion of green buildings.

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## EXAM PREPARATION

- ▶ GBCI Candidate Handbook
- ▶ Do you meet the criteria to take the exam?
- ▶ To register for the LEED AP exam, you must have completed an internship on a LEED project.
- ▶ Register for the exam and study.
- ▶ 100 questions, 2 hours, and 85 is passing.
- ▶ Read the discipline and exam rules.
- ▶ Read the identity protection program rules after the exam.
- ▶ The exam result is valid for 2 years.

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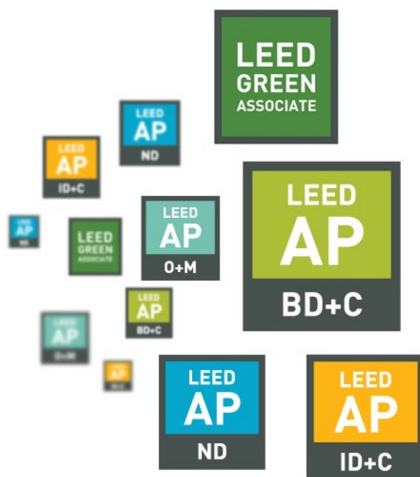
## GREEN ASSOCIATE

- Must participate in Green Building training or internship.
- Must pass the exam (\$350)
- Must complete 15 hours of industry training within two years.
- Must pay a \$50 fee every two years.

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## LEED AP



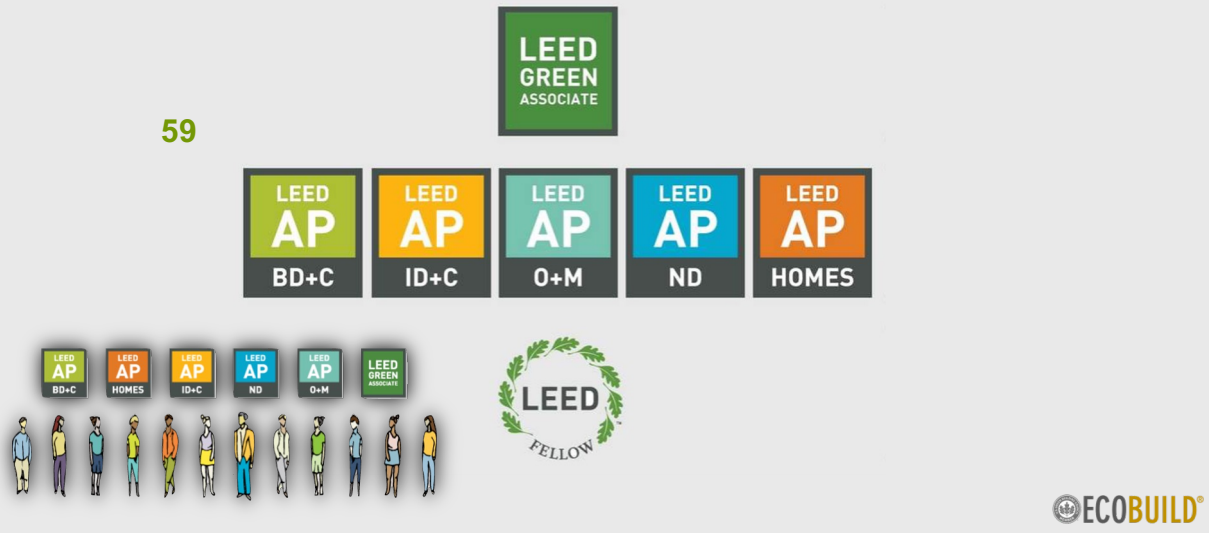
- Must have interned on at least 1 LEED® project.
- Specialization area must be selected.
- Must pass the LEED AP exam (\$350)
- Must complete 30 hours of sector training within 2 years.
- Must pay a membership fee of \$50 within 2 years.

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# LEED EXPERTISE?

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- LEED for Homes Green Rater
- It is a technical inspection expertise for the rating of homes.
- There are <sup>60</sup> separate training and application programs for this expertise.
- Green Classroom Professional
- It is a technical support expertise for the rating of schools. Typically, teachers specialize in this area.



ECOBUILD®

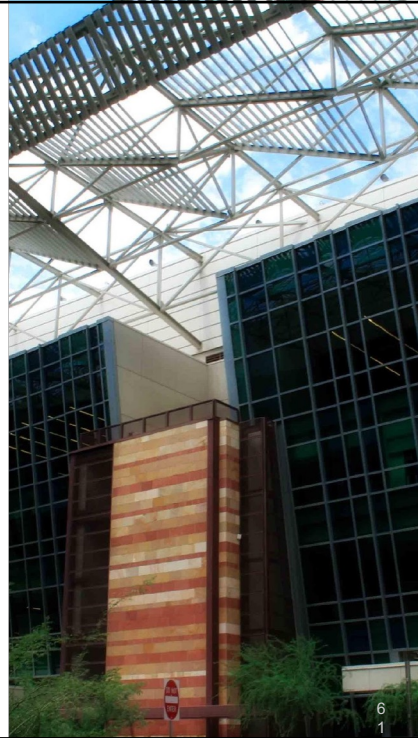
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# LEED V4 TRAINING PROGRAM

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## INTRODUCTORY TOPICS



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