Green Buildings and LEED Certification

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LEED Certification & Green Building Design

What is a Green Building?

A 'green' building is a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life.

Key Strategies

- Reduce energy and water use
- Healthy indoor environmental quality .
- Smart material selection – sustainable products.
- **Creating a more sustainable environment for all.**

What is LEED?

LEED-Leadership in Energy & Environmental Design

An Internationally recognised **green building rating system** which provides third-party verification that a building is designed and built using strategies aimed at increasing performance , reducing waste and improving quality of life.

Why LEED?

- Reduced operating costs
- Higher rent (as much as 10% above market value)
- Higher resale value
- Lower employee absenteeism & turnover
- Long-term environmental solution.

Who runs LEED?

US. Green Building Council (USGBC)

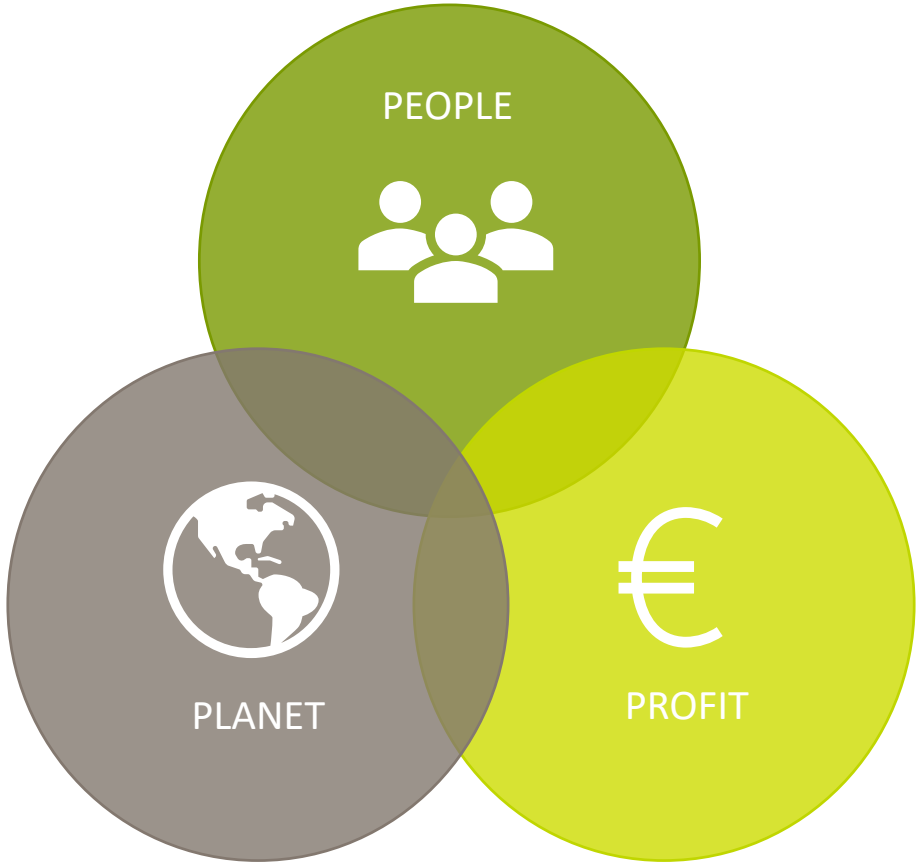
- LEED building rating system was created by USGBC in 1998
- The USGBC is a **non profit organisation**;
- USGBC are dedicated to **sustainable buildings**;
- There is national and local membership;
- **LEED V4.1** came into practice in 2019;
- USGBC Focuses on constantly **developing & redefining LEED standards;**
- USGBC's main goal is to protect **Triple bottom line**.

What is the Triple Bottom Line?

All green buildings should establish these three components:

- **Social responsibility** (people)
- **Environmental stewardship** (planet)
- **Commercial Sense** (profit)

LEED promotes the concept of the 'Triple bottom line'. The concept all green buildings should have an increased value , have an environmentally friendly design and serve well to its users and to the community. The main goal is to establish all three components in tandem with each other.



How does LEED aim to help the environment?

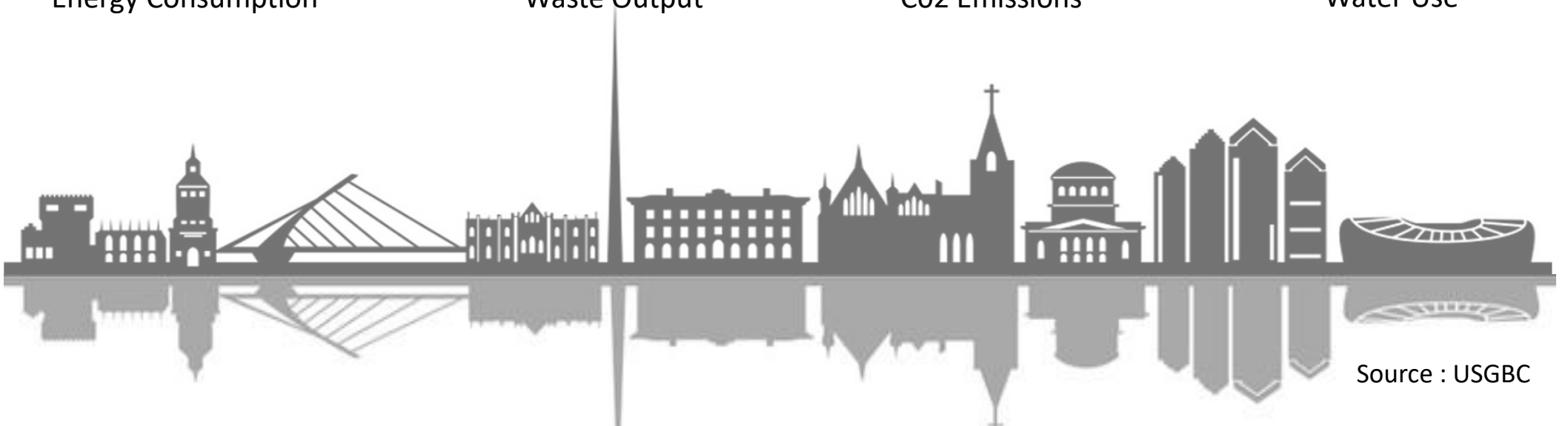
Driving costs and waste down

Energy Consumption

Waste Output

C02 Emissions

Water Use



Source : USGBC

Minimum Program Requirement (MPR's)

For a project to qualify for LEED Certification;

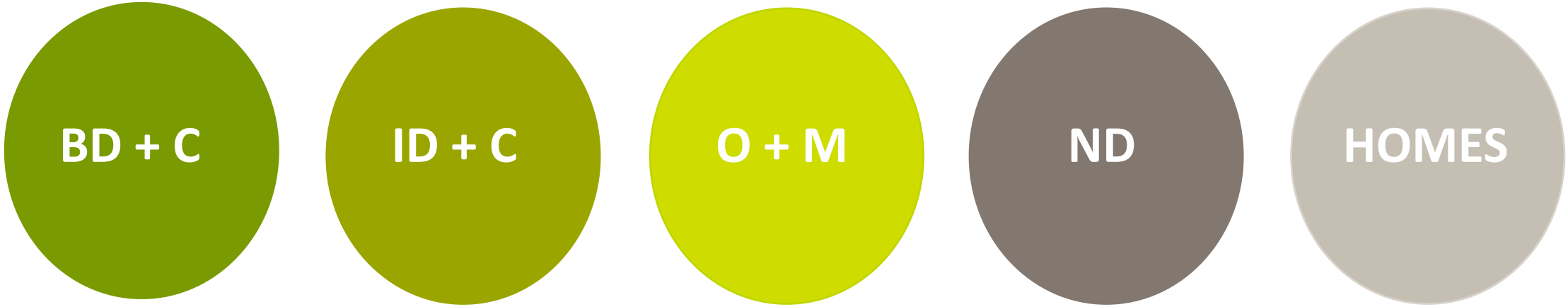
The very first step-even before registering your project - is confirming that your project can meet all seven

Minimum Program Requirements.

1. Must comply with all **environmental Laws**
2. Must be a complete, **Permanent Building** or space
3. Must use a **reasonable site boundary**
4. Must meet **minimum floor area requirement** (1,000 SF)
5. Must comply with **minimum Occupancy Rates** (1 FTE)
6. Must **share** building energy and water use **data**
7. Must comply with a **minimum building to site ratio**

LEED Rating system

Which Rating system applies to your project type?



Building Design and Construction

Interior Design and Construction

Building Operations and Maintenance

Neighbourhood Development

Homes

How to register a project?

Step 1 :What project type?

Step 2: Register project with GBCI - LEED online.

Step 3: Submission of application with supporting documentation (Drawings / reports / specs / sop's)

Step 4: 2 stage review of application – Design / construction phase

Step 5: Upon successful completion of prerequisites and targeted credits – a certification is awarded by USGBC. From Certified up to Platinum level.

LEED Certification & Credits (110 possible points)

Upon meeting MPR'S and registering the project the next step is to identify the projects targeted certification level:

Prerequisite- refers to a mandatory project criteria identified within the LEED rating system. Fulfilling the requirements of prerequisites will not earn points however they are mandatory to achieve certification.

Credit – A credit is a point awarded based on compliance with a specific sustainable strategy.
It is a four-tiered credit-based system. The more credits you achieve the more points you earn – the higher the certification level thus the more sustainable and green the project is.

US Green Building Council has four levels of LEED Certification:

LEED **Certified**
40- 49 points

LEED **Silver**
50- 59 points

LEED **Gold**
60- 79 points

LEED **Platinum**
80+ points

LEED Credit Categories – BD+C New Construction

1/8 : Integrative Process (1 point)

Integrative Process (IP) - This credit aims to identify and utilize opportunities to achieve synergies within a project team.

1. Submit a project letter showing how analysis informed design and building form, shown in projects OPR (owner project requirements) and basis of design (BOD) (1 point)

2/8 : Location & Transportation (16 points)

Location & Transportation (L&T) credit category of LEED V4.1 was created to ensure that a project's

1. LEED for Neighborhood Development Location (16 points)

OR

1. Sensitive Land Protection (1 point)
2. High Priority Site (2 points)
3. Surrounding Density and Diverse Uses. (1 point)
4. Access to Quality Transit (3 points)
5. Bicycle Facilities (2 points)
6. Reduced Parking Footprint (1 point).
7. Green Vehicles. (1 point)

3/8 : Sustainable Sites (10 points)

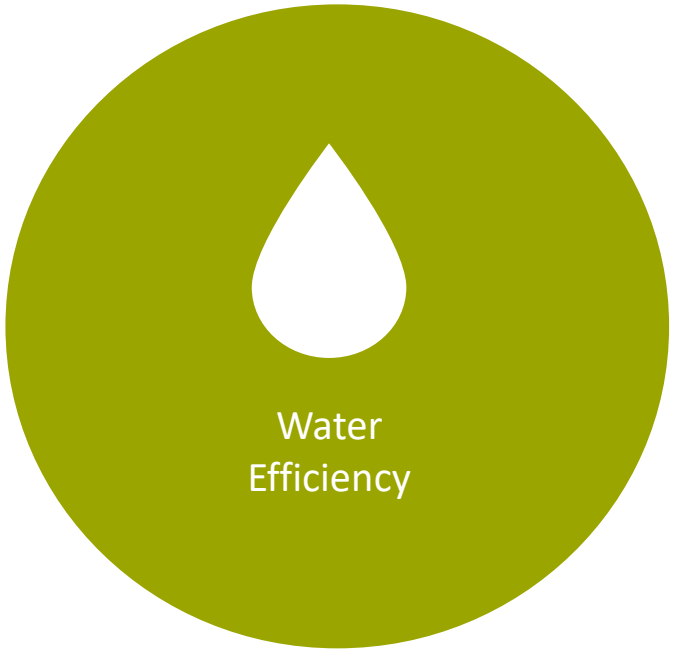
Sustainable Sites (SS) created to ensure that a project's natural environment would be valued and respected throughout every step of the building process, from planning to construction to management.

1. Construction Activity Pollution Prevention (Prerequisite)
2. Site Assessment (1 point)
3. Protect or Restore Habitat (2 points)
4. Open Space (1 point)
5. Rainwater Management (3 points)
6. Heat Island Reduction (2 points)
7. Light Pollution Reduction (1 point).

4/8 : Water efficiency (11 points)

Water Efficiency (SS) – aims to encourage smarter use of water, inside and outside the building.

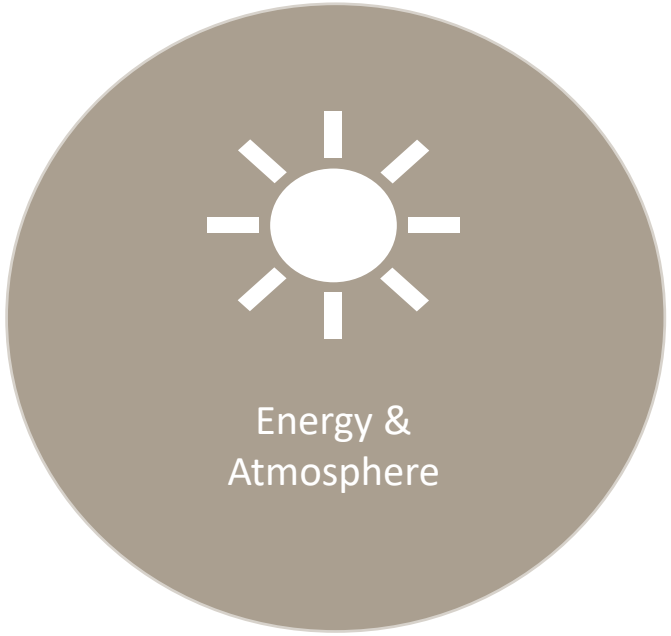
1. Outdoor Water Use Reduction (Prerequisite)
2. Indoor Water Use Reduction (Prerequisite)
3. Building-Level Water Metering (Prerequisite)
4. Outdoor Water Use Reduction (2 points)
5. Indoor Water Use Reduction (6 points)
6. Cooling Tower Water Use (2 points)
7. Water Metering (1 point).



5/8 : Energy & Atmosphere (33 points)

Energy & Atmosphere - The Energy and Atmosphere (EA) category is about designing a building that uses as little energy as possible through conservation, efficiency, and the use of alternative renewable energy source.

1. Fundamental Commissioning and Verification (Prerequisite)
2. Minimum Energy Performance (Prerequisite)
3. Building-Level Energy Metering (Prerequisite)
4. Fundamental Refrigerant Management (Prerequisite)
5. Enhanced Commissioning (6 points)
6. Optimize Energy Performance (18 points)
7. Advanced Energy Metering (1 points)
8. Grid Harmonisation (2 point).
9. Renewable Energy (5 point).
10. Enhanced Refrigerant Management (1 point).



6/8 : Materials & Resources (13 points)

Materials & Resources – focuses on minimising the embodied energy and other impacts associated with the extraction , processing , transport , maintenance and disposal of building materials.

1. Storage and Collection of Recyclables (Prerequisite)
2. Building Life-Cycle Impact Reduction (5 points)
3. Building Product Disclosure and Optimization – Environmental Product Declarations (2 points)
4. Building Product Disclosure and Optimization – Sourcing of Raw Materials (2 points)
5. Building Product Disclosure and Optimization – Material Ingredients (2 point).
6. Construction and Demolition Waste Management (2 point).

7/8 : Indoor Environmental Quality (16 points)

Indoor Environmental Quality - aims to protect the health and wellbeing of those who occupy the building.

1. Minimum Indoor Air Quality performance (Prerequisite)
2. Environmental Tobacco Smoke Control (Prerequisite)
3. Enhanced Indoor Air Quality Strategies (2 points)
4. Low-emitting Materials (3 points)
5. Construction Indoor Air Quality Management Plan (1 point)
6. Indoor Air Quality Assessment (2 points).
7. Thermal Comfort (1 point)
8. Interior Lighting (2 points).
9. Daylight (3 points).
10. Quality Views (1 point)
11. Acoustic performance (1 point).

8/8 : Innovation / Regional Priority Credit (10 points)

Innovation – 6 points

1. Innovation (5 points)
2. LEED Accredited Professional (1 point)

Regional Priority Credit – 4 points

1. Regional Priority : Specific Credit option 1 (1 point – 4 options)

Scorecard :BD+C New Construction

LEED v4.1 BD+C
Project Checklist

Project Name:
Date:

Y	?	N			
			Credit	Integrative Process	1

Y	?	N		Location and Transportation	16
			Credit	LEED for Neighborhood Development Location	16
			Credit	Sensitive Land Protection	1
			Credit	High Priority Site	2
			Credit	Surrounding Density and Diverse Uses	5
			Credit	Access to Quality Transit	5
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
			Credit	Electriv Vehicles	1

Y	?	N		Sustainable Sites	10
Y			Prereq	Construction Activity Pollution Prevention	Required
			Credit	Site Assessment	1
			Credit	Protect or Restore Habitat	2
			Credit	Open Space	1
			Credit	Rainwater Management	3
			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1

Y	?	N		Water Efficiency	11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
			Credit	Outdoor Water Use Reduction	2
			Credit	Indoor Water Use Reduction	6
			Credit	Cooling Tower Water Use	2
			Credit	Water Metering	1

Y	?	N		Energy and Atmosphere	33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
			Credit	Enhanced Commissioning	6
			Credit	Optimize Energy Performance	18
			Credit	Advanced Energy Metering	1
			Credit	Grid Harmonization	2
			Credit	Renewable Energy	5
			Credit	Enhanced Refrigerant Management	1

Y	?	N		Materials and Resources	13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
			Credit	Building Life-Cycle Impact Reduction	5
			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Material	2
			Credit	Building Product Disclosure and Optimization - Material Ingredients	2
			Credit	Construction and Demolition Waste Management	2

Y	?	N		Indoor Environmental Quality	16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Low-Emitting Materials	3
			Credit	Construction Indoor Air Quality Management Plan	1
			Credit	Indoor Air Quality Assessment	2
			Credit	Thermal Comfort	1
			Credit	Interior Lighting	2
			Credit	Daylight	3
			Credit	Quality Views	1
			Credit	Acoustic Performance	1

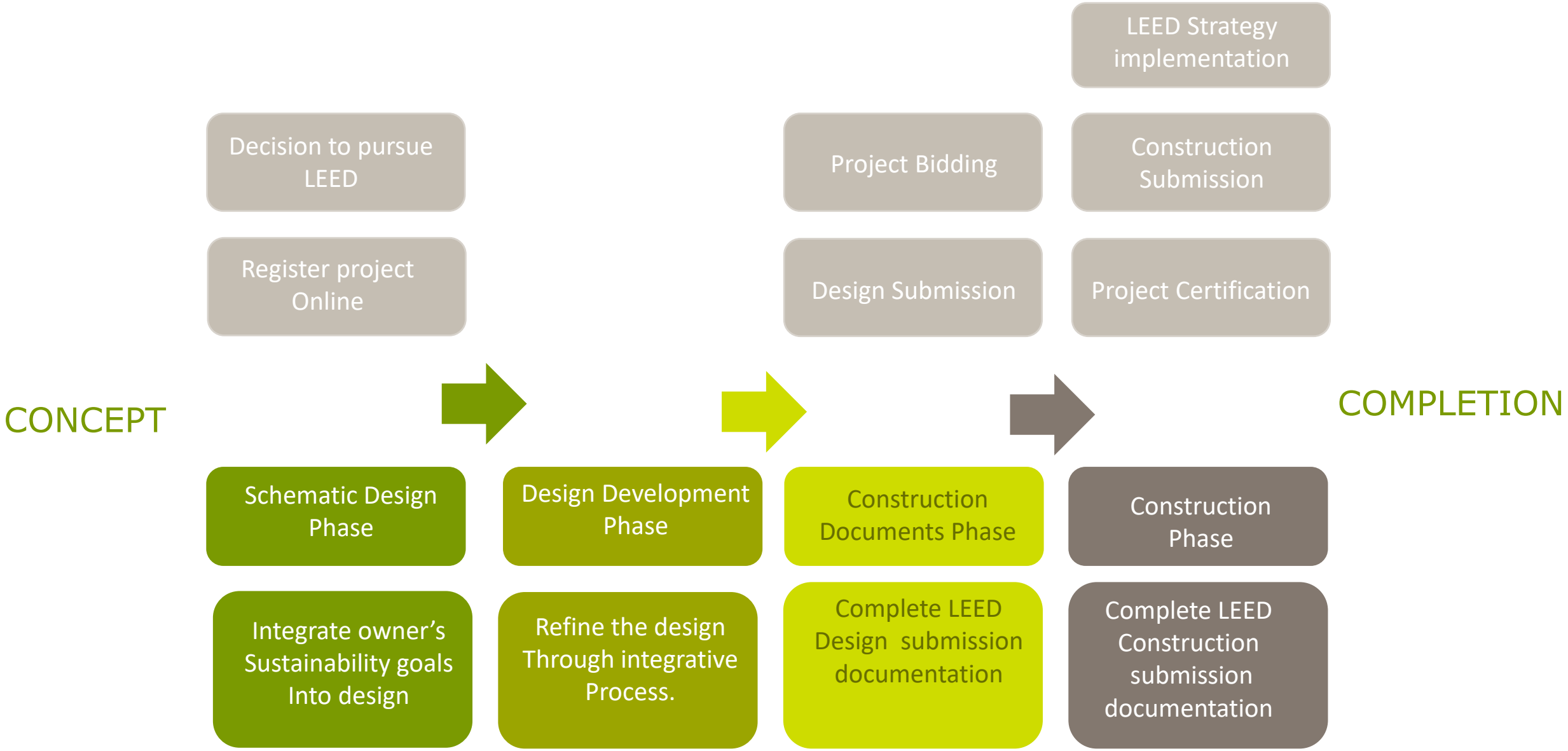
Y	?	N		Innovation	6
			Credit	Innovation	5
			Credit	LEED Accredited Professional	1

Y	?	N		Regional Priority	4
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1

Y	?	N	TOTALS	Possible Points:	110

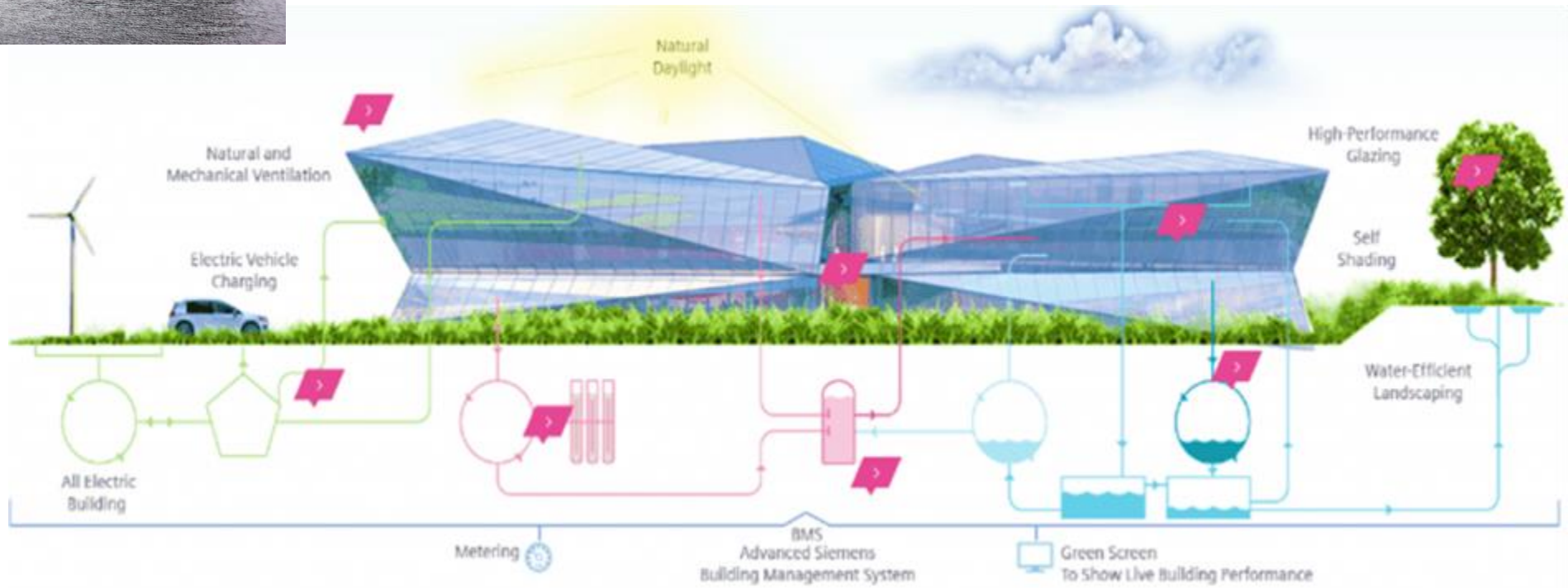
Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

LEED Timeline Overview



Case study – The Crystal , London Built by Siemens

- 70% Illuminated by natural light due to its triple glazed windows.
- Solar panels produce 20% of the electricity the building uses.
- Rainwater is collected from the roof and stored in an under ground tank for use in the building.
- 100% of water used in the toilets is taken from non-potable sources
- 3,500 data points used by Siemens Building Management to monitor building energy consumption.



Advantages to LEED

- **Healthier environments** for the occupants.
- Improved **Productivity** within staff.
- Globally improved **Business Image.**
- **Reduced Utility Consumption**
- **Lower** operating **costs**.
- Enhanced **Tax benefits**.
- **Minimises waste / maximises reuse**
- **Higher** lease **rates.**
- **Greater** resale **value**.
- **A positive Environmental Impact.**

Professional credentials

LEED Green Associate

- Denotes proficiency in today's sustainable design, construction and operations standards selection & sourcing.
- Prep course available through Irish Green Building Council – e225 / Exam through USGBC $250
- 2 hour online exam.

LEED Accredited Professional

- Credential signifies an advanced depth of knowledge in green building practices
- LEED project experience strongly recommended.
- Prep course through GBES– e400 / Exam through USGBC $400
- 2 hour online exam.

Further Reading

- https://www.igbc.ie/ -Irish Green Building Council
- www.usgbc.org –U.S Green Building Council
- https://www.gbes.com/ - Green Building Education Services.
- www.worldgbc.org –World Green Building Council

Thank you

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