Confederation of Indian Industry

IGBC Green Factory Building Rating System

Version 2.0

(For New and Existing Factory Buildings)

IGBC

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(Edited with Addendum 1.0)

Indian Green Building Council
C/o Confederation of Indian
Industry CII – Sohrabji Godrej
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Foreword from the Indian Green Building Council (IGBC)

India is witnessing tremendous growth in infrastructure and construction development. The construction industry in India is one of the largest economic activities and is growing at an average rate of 9.5% as compared to the global average of 5%. As the sector is growing rapidly, preserving the environment poses a host of challenges. To enable the construction industry to be environmentally sensitive, CII-Sohrabji Godrej Green Business Centre has established the Indian Green Building Council (IGBC). IGBC is a consensus driven not-for- profit council representing the building industry, consisting of more than 2,050 committed member organizations. The council encourages builders, developers and owners to build green to enhance the economic and environmental performance of buildings.

The Green Building Movement in India has been spearheaded by IGBC since 2001, by creating national awareness. The council's activities have enabled a market transformation with regard to green building concepts, materials and technologies.

IGBC continuously works to provide tools that facilitate the adoption of green building practices in India. The development of IGBC Green Factory Building Rating System is another important step in this direction.

IGBC Membership

IGBC draws its strength from its members who have been partners in facilitating the Green Building Movement in India. The local chapters led by individual champions and committed members have been instrumental in reaching out the vision of the IGBC at the regional levels. IGBC is today seen as a leader in spearheading the Indian Green Building Movement. The council is member driven and consensus based.

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Our special thanks to the following members for their participation and contributions in developing the rating programme:

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I. Introduction

With the advancement of the green building movement in India, many companies have evinced keen interest in having a holistic green design and construction framework for upcoming factory buildings. The national GDP is expected to grow at about 7%, and the contribution of the manufacturing sector to the national GDP being quite significant at 25%, more and more factories would be set up in the country. While growth is imminent, development must happen in an environmentally sustainable manner. In this context, the development and launch of a green rating programme for factory buildings would have far-reaching impacts on saving natural resources, betterment of working conditions and enhanced productivity, thereby leading to substantial national benefits.

Green concepts and techniques in the industry can help address national issues like energy efficiency, conservation of natural resources, handling of consumer waste, water efficiency and reduction in fossil fuel use in commuting. Most importantly, these concepts can enhance occupant health, happiness, and wellbeing. The concept of a rating would encourage designers to address these by design.

IGBC has set up the Green Factory Building Core Committee to develop the rating programme. This committee is comprised of key stakeholders, including corporates, architects, consultants, developers, manufacturers, and institutions. The committee, with a diverse background and knowledge, has enriched the rating system both in its content and process.

This rating system would address the factory buildings and not the processes. It would be applicable to all sectors of industry and for all climatic zones of India.

National Benefits:

The anticipated long-term benefits, assuming a 600 green factory building stock erected in the next 5-6 years, are the following:

- Reduction in power demand by factory buildings
- Reduction in GHG emissions
- Reduction in potable water consumption
- Increase of green cover in new factory premises, thereby reducing the heat island effect
- Recharge of aquifers with stormwater
- Enhanced indoor air quality leading to at least 1% productivity gains

II. Benefits of Green Factory Building

A green factory building can have tremendous benefits, both tangible and intangible. The most tangible benefits are the reduction in water and energy consumption right from the day of occupancy. The energy savings could range from 30 – 40 %, and water savings around 20 – 30%. Intangible benefits of a green factory include enhanced indoor air quality, good daylighting, health, wellbeing, and safety of the workforce.

National Priorities Addressed in the Rating System

Water Efficiency:

India is the second most populous nation in the world with a billion people. 70 percent of India's irrigation needs and 80 percent of its domestic needs are met by groundwater. According to World Bank estimates, by the year 2020 India is expected to experience severe water stress with the per capita availability of water projected to fall below 1,000 cubic meters per year as compared to 2,000 cubic meters per year in 1997. Water demand is expected to rise with the expanding urbanisation and industrialisation. Effective water management strategies are needed to address the crisis. The green factory building rating encourages use of water in a self - sustainable manner through reduce, recycle, and reuse strategies.

Handling of Waste:

With expanding industrialisation and urbanisation, the quantity of waste generated is increasing. Several studies indicate that about 25 million tons of municipal waste and 10 million tons of hazardous waste are generated annually. In the present waste management scenario, almost 90% of the waste generated requires around 1,200 hectares of land per year for disposal. The waste is either dumped or burned, producing hazardous gases and leaching of toxins into the soil. Segregation of waste at source, diverting the material to the local recycling facilities and the reuse of materials, thereby reducing waste dumped in the landfills, are some of the strategies encouraged by the rating system.

Energy Efficiency:

Buildings consume a significant amount of energy, of which there is a potential to save 30 to 40%. This rating system mainly addresses the efficiency of the factory building energy consumption. Considering the tremendous knowledge and awareness levels amongst factory owners and designers, factory buildings are well-positioned to embrace the latest trends and technologies in enhancing energy efficiency.

Reduced Use of Fossil Fuels:

Due to the rise in the standard of living, economic activities are increasingly becoming energy and technology intensive. Fossil fuel consumption is increasing worldwide to keep up with the changing needs. The dependence on fossil fuels also raises the risk of climate change. Major contributions to atmospheric pollution and climate change are believed to be from carbon emissions produced from the combustion of fossil fuels. The rising fossil fuel demand has evoked a fear of running out of fuel reserves in the future. To reduce the dependency on fossil fuels and the resultant air pollution, the rating system encourages the use of alternate fuels for transportation, public transportation, biofuels for captive power generation, green power and on-site renewable energy generation.

Reduced Dependency on Virgin Materials:

Rising industrial needs demand greater use of materials for various activities. Use of non-renewable, virgin materials would pose a risk of depleting the available natural

resources. The rating system encourages projects to use recycled & reused materials and discourages the use of virgin wood, thereby addressing environmental impacts associated with extraction and processing of virgin materials.

Occupational Health:

Occupational Health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations, which requires good health, adaptation to work and controlling risks. Occupational health is one of the major concerns in providing safety and good working conditions in the industrial sector to reduce the risk of problems related to work. The rating system addresses some of the issues related to occupational health, such as avoiding the use of asbestos in construction, providing breakout spaces, etc.

III. IGBC Green Factory Building Rating System

IGBC has set up the Core Committee to develop and maintain the ratings with ongoing contemporary relevance to the industry. The committee consists of industry, academia, government, material manufacturers and institutions to provide strategic input and guidance. The diversity in the professions and experience of the members brings in a holistic perspective in the process of developing the rating programme.

a. Evolution of the Rating System

IGBC, in its endeavour to extend green building concepts to all building types, envisioned a rating programme for factory buildings in May 2008. A core committee was formed under the leadership of Mr. Pradeep Bhargava, Managing Director, Cummins Generator Technologies India Ltd. The committee drafted the pilot version of the programme, which was launched in May 2009. The rating system is designed to suit the Indian climate and construction practices.

The rating system will be subject to review by the core committee every 6 months to ensure that it is updated and contemporary.

b. Features of IGBC Green Factory

The IGBC Green Factory Building Rating System is a voluntary and consensus-based programme. The rating system has been developed based on materials and technologies that are currently available. This rating system would facilitate the development of energy-efficient, water-efficient, healthy, more productive, and environmentally friendly factories.

The rating system evaluates certain credit points using a prescriptive approach and other credits on a performance-based approach. The rating system has evolved so as to be comprehensive and at the same time user-friendly. The programme is fundamentally designed to address national priorities and quality of life for the factory workforce.

The rating programme uses well-accepted national and international standards. Wherever local or national standards are not available, appropriate international benchmarks have been considered.

c. The Future of IGBC Green Factory Building

Many new green building materials, equipment and technologies are being introduced in the market. With continuous upgradation and the introduction of new green technologies and products, it is important that the rating programme also keeps pace with current standards and technologies. Therefore, the rating programme will also undergo periodic revisions to incorporate the latest advances and changes. It is important to note that project teams applying for IGBC Green Factory Building should register their projects with the latest version of the rating system. During the course of implementation, projects have the option to transition to the latest version of the rating system. IGBC will highlight new developments on its website on a continuous basis at www.igbc.in

IV. Type of certification and process

► Precertification

Projects under development can register for Precertification. This is an option provided for projects aspiring to get precertified at the design stage. Precertification also gives the developer a unique advantage to market the project to potential buyers.

The documentation submitted for precertification must detail the project design features that will be implemented. The rating awarded under precertification is based on the project's intention to conform to the requirements of the IGBC Green Factory Building Rating system®. It is important to note that the precertification rating awarded need not necessarily correspond to the final rating.

Pre-certified projects are required to provide the status of the project to IGBC, in relation to the rating, once every six months until the award of the final rating. Those projects that seek precertification need to submit the following documentation:

1. General information about project, including
    a. Project brief stating project type, different type of spaces, occupancy, number of floors, area statement, etc.
    b. General drawings (in PDF format only):
        - Master/ Site plan
        - Parking plans
        - Floor plans
        - Elevations
        - Sections
    c. Timestamp photographs/ Rendered views
    d. Filled-in templates
    e. Narratives and supporting documentation such as conceptual drawings, estimate/tentative calculations (in excel sheets), declarations from the owner, etc., for each of the mandatory requirements and credits

The Precertification is valid for 3 years from the date of award, after which projects are required to apply for the full certification (or) submit construction progress reports once in every six months to get an extension certificate for Precertification rating.

- **Certification**

The IGBC Green Factory Building addresses both the new and existing factory buildings.

The existing factory buildings should address the following measures (illustrative) before applying for certification:

- Soil erosion control measures in future
- Changes in design to accommodate the requirements of differently abled people, like easy access to lifts, restrooms etc.,
- Change to low-flow water fixtures
- Rainwater harvesting
- Limit turf areas
- Have a policy for the use of green materials in future
- Minimum fresh air ventilation
- Comfort conditions
- Use of eco-friendly housekeeping materials

The rating system is valid for 3 years. On completion of 3 years, projects can be validated/renewed based on the latest prevailing version. The guidelines detailed under each credit enable the design and construction of green factory buildings of all sizes and types.

The IGBC Green Factory Building rating addresses green features under the following categories:

- Site Selection and Planning
- Water Conservation
- Energy Efficiency
- Materials & Resources
- Indoor Environment Quality
- Innovation in Design & Operation

Different levels of green building certification are awarded based on the total credits earned. However, every green factory building should meet certain mandatory requirements, which are non-negotiable.

► **IGBC Green Factory Building Certification Levels**

Certification Level	New Factory	Existing Factory	Recognition
Certified	50-59	43-50	Best Practices
Silver	60-69	51-58	Outstanding Performance
Gold	70-79	59-67	National Excellence
Platinum	80-100	68-85	Global Leadership

V. IGBC Green Factory Building Registration

Project teams interested in IGBC Green Factory Building Certification for their project must first register with IGBC. Projects can be registered on IGBC website (www. igbc.in) under 'IGBC Green Factory Building'. The website includes information on registration fees for IGBC member companies as well as non-members. Registration is the initial step that helps establish contact with IGBC and provides access to the required documents, templates, important communications, and other necessary information. Consult the website for important details about IGBC Green Factory Building application as well as the certification review process, schedule and fee.

VI. Documentation

The project team is expected to provide supporting documents for all the mandatory requirements and the credits attempted. Supporting documents are those that provide specific proof of meeting the required performance level, such as specifications, drawings (in native format only), cutsheets, manufacturer's literature, purchase invoices and other documents.

These details are mentioned in this guide, under each credit / mandatory requirement.

The project documentation is submitted in two phases - Preliminary submittal and Final submittal:

The preliminary phase involves submission of all documents, which shall include the mandatory requirements and the Attempted credits? After the preliminary submission, review is done by third party assessors and review comments would be provided within 30 working days.

The next phase involves submission of clarifications to preliminary review queries and final submittal. This review will also be provided within 30 working days, after which the rating is awarded.

It is important to note that the mandatory requirements and credits earned at the preliminary review are only considered as expected. These mandatory requirements and credits are not awarded until the final documents are submitted, along with additional documents showing implementation of design features. If there are changes in any 'expected credits' after preliminary review, these changes need to be documented and resubmitted during the final review.

VII. Credit Interpretation Ruling

In some instances, the design team can face certain challenges in applying or interpreting a mandatory requirement or a credit. It can also happen in cases where the project can opt to achieve the same goal through a different compliance route.

To resolve this, IGBC uses the process of 'Credit Interpretation Ruling' (CIR) to ensure that rulings are consistent and applicable to other projects as well.

The following are the steps to be followed in case the project team faces a problem:

- Consult the Reference Guide for a description of the credit goal, compliance options and calculations.
- Review the goal of the credit or mandatory requirement and self-evaluate whether the project satisfies the goal.
- Review the Credit Interpretation web page for previous CIR on the relevant credit or mandatory requirement. All projects registered under IGBC Green Factory will have access to this page.
- If a similar CIR has not been addressed or does not answer the question sufficiently, submit a credit interpretation request. Only registered projects are eligible to post CIRs. Two CIRs are answered without levying any fee and for any CIR beyond the first two CIRs, a fee is levied.

VIII. Appeal

Generally, credits get denied due to misinterpretation of the goal. On receipt of the final review, the project team has the option to appeal to IGBC for reassessment of denied credits or mandatory requirements. The documentation for the mandatory requirements or credits seeking appeal may be resubmitted to IGBC along with the necessary fee. IGBC will take 30 working days to review such documentation. These submissions would be reviewed by an assessor not involved in the earlier assessments. Documentation for appeals should include the following:

i. Documentation submitted for design submission

ii. Documentation submitted for construction submission

iii. Clarifications along with necessary drawings and calculations

IX. Fee

Certification fee details can be found on the IGBC website.

X. Updates and Addenda

This is the second version of IGBC Green Factory Building Reference Guide. As the rating system continues to improve and evolve, updates and addenda to the reference guide will be made available through the website. These additions will be incorporated in the next version of the rating system.

XI. IGBC Green Factory Building Checklist

IGBC Green Factory Building Rating System			
Requirement		**Available Points**	
		New Factory Building	**Existing Factory Building**
Site Selection and Planning			
SSP MR 1	Local Building Regulations	Required	Required
SSP MR 2	Soil Erosion Prevention & Control	Required	Required
SSP CR 1	Access to Public Transport	1	1
SSP CR 2	Basic Amenities	2	2
SSP CR 3	Natural Topography and Vegetation	2	2
SSP CR 4	Urban Heat Island Mitigation	4	4
SSP CR 5	Green Transportation Facility	3	3
SSP CR 6	Universal Design	2	2
SSP CR 7	Outdoor Light Pollution Reduction	1	1
SSP CR 8	Awareness on Green Concepts	1	1
Total Credit Points		**16**	**16**
Water Conservation			
WC MR 1	Rainwater Harvesting	Required	Required
WC MR 2	Water Efficient Plumbing Fixtures	Required	Required
WC CR 1	Sustainable Landscape Design	3	3
WC CR 2	Management of Irrigation System	2	2
WC CR 3	Enhanced Rainwater Harvesting	4	4
WC CR 4	Wastewater – Treatment	1	1
WC CR 5	Water Metering and Management	2	2
WC CR 6	Enhanced Water Efficiency	4	4
WC CR 7	Alternative Water Consumption	4	4
Total Credit Points		**20**	**20**
Energy Efficiency			
EE MR 1	Eco-friendly Refrigerant	Required	Required
EE MR 2	Minimum Energy Performance	Required	Required
EE MR 3	Commissioning Plan for Building Systems	Required	NA
EE CR 1	Eco-friendly Refrigerant Management	1	1
EE CR 2	Enhanced Energy Performance	12	12
EE CR 3	Green Power	8	8
EE CR 4	Eco-Friendly Captive Power Generation	1	1
EE CR 5	Energy Monitoring	2	2
Total Credit Points		**24**	**24**

Materials & Resources			
MR MR 1	Waste Management	Required	Required
MR CR 1	Sustainable Procurement	2	1
MR CR 2	Organic Waste Management	2	2
MR CR 3	Construction Waste Management	2	NA
MR CR 4	Materials with Recycled Content	3	NA
MR CR 5	Local Materials	3	NA
MR CR 6	Use of Salvaged Materials	2	NA
MR CR 7	Eco-friendly Wood Based Materials	2	NA
Total Credit Points		**16**	**3**
Indoor Environment Quality and Occupational Health			
IEQ MR 1	No Smoking Policy	Required	Required
IEQ MR 2	Minimum Fresh Air Requirements	Required	Required
IEQ MR 3	Avoid use of Asbestos in the Building	Required	Required
IEQ CR 1	Enhanced Fresh Air Ventilation	4	4
IEQ CR 2	Building Flush Out	1	NA
IEQ CR 3	Low VOC Materials	2	2
IEQ CR 4	Eco-Friendly Housekeeping Chemicals	2	2
IEQ CR 5	Indoor Air Quality	2	2
IEQ CR 6	Daylighting	5	5
IEQ CR 7	Occupant Well-being Facility	2	2
Total Credit Points		**18**	**17**
Innovation in Design & Operation			
ID CR 1.1	Innovation in Design & Operation	1	1
ID CR 1.2	Innovation in Design & Operation	1	1
ID CR 1.3	Innovation in Design & Operation	1	1
ID CR 1.4	Innovation in Design & Operation	1	1
ID CR 1.5	Innovation in Design & Operation	1	NA
ID CR 2	IGBC AP (Accredited Professional)	1	1
Total Credit Points		**6**	**5**
Total Credit Score		**100**	**85**


Site Selection
& Planning

Local Building Regulations

SSP Mandatory Requirement 1

Intent

To ensure that the factory building design complies with the required statutory and regulatory codes

Compliance options:

The project shall comply with the following statutory approvals from the Central or State Government authorities, as applicable:

- Approval of the Site Plan (and/or) Building Plan from the competent Government authority
- Approval for all statutory requirements relating to the construction and operation of the project

Documentation Required:

(i). Provide an approved Site Plan (and/or), Factory/Building Plan and Occupancy certificate from a competent Government authority.

(ii). Submit the consent to operate letter obtained from the competent authority.

(iii). Photographs of the factory building.

(iv). Declaration from the authorised signatory confirming that no approvals or clearances from the government, local byelaws, or any other regulatory bodies are pending

Soil Erosion Prevention & Control

SSP Mandatory Requirement 2

Intent

To control soil erosion and thereby reduce negative impacts to the site.

Compliance options:

New Factory

Adopt all the measures listed below to control erosion:

- Ensure soil erosion control measures before and during construction that confirm to the best management practices highlighted in the National Building Code of India 2016: Part 10, Section 1: Landscape Planning, Design and Development (Protection of Landscape During Construction and Soil and Water Conservation).
- Ensure that fertile topsoil is stockpiled prior to construction for future reuse.
- Develop measures to address soil erosion post-occupancy
- Prepare Operation & Maintenance (O&M) Plan for soil erosion prevention and control measures.

Existing Factory

- Develop post-occupancy erosion control measures such as maintenance of the storm water network and green cover.
- In case of expansion/retrofitting, follow the compliance options recommended for the New Factory project.

Documentation Required:
New Factory:

(i). Narrative describing the soil Erosion and Sedimentation Control (ESC) measures implemented in the project as prescribed in NBC, during construction and post occupancy. The narrative shall include, but not be limited to, the following ESC measures:
  - Before Construction: Topsoil preservation, preservation of existing vegetation/trees
  - During Construction: Site barrication, wheel washing, sedimentation pit/basin, swales/ temporary storm water drains, mulching, temporary vegetation
  - Post Construction: Storm water channels, sediment pit/ basin, rainwater harvesting, vegetation.

(ii). Site drawings highlighting the ESC measures implemented on-site, during construction and post occupancy.

(iii). Photographs showing ESC measures taken at various stages of construction.

Note: In case the topsoil (20 cm) is not fertile, please submit a soil test report to justify compliance with the Mandatory Requirement.

Existing Factory:

(i). Narrative and photographs of the measures implemented to prevent soil erosion.

(ii). Storm water layout and photographs of trenches, pits, rainwater collection tank etc. provided.

(iii). Operation and Maintenance (O&M) plan to prevent soil erosion post-construction.

Access to Public Transport

SSP Credit 1 **Points: 1**

Intent

Reduce air pollution and land development impacts from personal automobile use.

Compliance options:

Option-1: Public Transport **Credit Point: 1**

Locate the factory within 2.0 km walking distance to an intra-city railway station (or) permanent bus stop (or) any other mode of transport, measured from the main entrance of the factory.

Or

Option-2: Shuttle Service **Credit Point: 1**

Provide dedicated shuttle services to cover at least 50% of the employees.

Documentation Required:

(i). Option-1: Aerial map highlighting the walking distance of public transport from the main entrance of the factory.

(ii). Option-2: Copy of the latest contract agreement recently signed between factory management and shuttle service provider, clearly indicating type and number of vehicles, along with seating capacity.

(iii). Photographs showing the public transport facility and/or provided shuttle services.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Basic Amenities

SSP Credit 2 **Points: 2**

Intent

To enhance the overall quality of life by providing amenities within and closer to the site.

Compliance options:

Provide at least three basic amenities listed in *Category 1* within a distance of 2 km from the entrance of the factory. (1 point)

AND

Provide at least three in-situ amenities as listed in *Category 2* (1 point)

Note:

- *Basic amenities within the campus can be considered to demonstrate compliance.*
- *Basic amenities shall be functional at the time of project certification.*

Documentation Required:

(i). Provide an aerial map (to the scale) indicating the pedestrian walking distances from the main entrance of the factory site to the basic amenities.

(ii). Photographs of the basic amenities provided.

Exemplary Performance:

This credit is not applicable for exemplary performance.

List of Basic Amenities

Category 1: Within 2 km from the factory	Category 2: Facilities provided in-situ
► Grocery / Retail Store ► School ► Bank ► Restaurant ► Multi-purpose halls ► Fire Station ► Medical clinic / Hospital / Dental ► Pharmacy ► Courier service	► First aid medical facility ► Crèche ► Lockers and showers ► Canteen ► Resting Rooms ► Gymnasium

Natural Topography and Vegetation

SSP Credit 3 **Points: 2**

Intent

Minimise disturbances to the site so as to reduce long-term environmental impacts, thereby promoting habitat and biodiversity.

Compliance Options:

Option 1: Natural Topography and/or Landscape Area

Avoid disturbance to the site by retaining natural topography (and/or) design landscape spaces on ground for at least 20% of the site area.

Points are awarded as below:

Percentage of Site Area with Natural Topography and/or Landscape Area	Points
≥ 20%	1
≥ 30%	2

Notes:

- *Retaining 'Natural Topography' in its broad sense means preserving the natural features of the terrain such as exposed natural rocks, water body, etc.,*
- *Vegetation/ Soft landscape shall not be designed with monoculture plant species, since such species would not promote habitat and biodiversity.*
- *Vegetation on the ground shall only be considered; vegetation overbuilt structures such as roofs, basement, podiums, etc., shall not be considered.*
- *Grass medians, grass pavers, jogging tracks, open-air theatre, parking areas, driveways, walkways, playgrounds, swimming pools, etc., are considered as site disturbances.*
- *Only native/adaptive vegetation shall be considered for this credit calculation.*
- *Potted plants shall not be considered as vegetation.*
- *Artificial vegetation shall not be considered for this credit calculation.*

Or

Option 2: Vegetation over Built Structures

Restore disturbed site area by designing vegetated spaces over built structures and on the ground, for at least 30% of the site area.

% of Site Area with Vegetation overbuilt structures and on ground	Points
≥ 30%	1
≥ 40%	2

Notes:

- *Development footprint includes building footprint and other hardscapes areas such as parking, footpaths, walkways, roads, grass medians, grass pavers, etc.,*
- *Vegetation/ Soft landscape shall not be designed with monoculture plant species, since such species would not promote habitat and biodiversity.*
- *Vertical Landscaping to the external walls can also be considered for this credit calculation.*
- *Vegetation on the ground as well as vegetation over built structures such as roofs, basement, podiums, etc., can be considered.*
- *Partially vegetated areas and disturbed site areas such as grass pavers, grass medians, jogging track, open-air theatre, playground, is considered as site disturbances and shall not be considered.*
- *Potted plants shall not be considered as vegetation.*
- *Artificial vegetation shall not be considered.*
- *Only fully developed landscape area is considered for credit compliance (partial or landscape under development cannot be considered for compliance).*

Documentation Required:

Option 1:

(i). Provide landscape plan clearly indicating the site / roof area with natural topography and landscape developed.

(ii). Landscape area calculations along with photographs of each bedding area.

(iii). Declaration from the authorised signatory stating that the landscape/open area will remain open for the life of the project.

Option 2:

(i). Provide site drawing and building roof plans clearly indicating the area with vegetation as applicable.

(ii). Calculations indicating the total area with vegetation over the built structures and on-ground to the total site area along with timestamp photographs showing the vegetation.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation, if more than 40% of the site area has natural topography (and/or) landscape spaces.

Urban Heat Island Mitigation

SSP Credit 4 **Points: 4**

Intent

Mitigate Urban Heat Island effect to minimise the negative impact on the microclimate

Compliance Option

Exposed Roof: **Points: 2**

Implement green measures to minimize the Urban Heat Island effect by covering at least 50% of the exposed roof area.

Points are awarded as below:

Percentage of exposed roof area covered with High Reflective Material	Points
> 50%	1
> 75%	2

Minimum Solar Reflective Index (SRI) values for different roof types are provided below:

Table 1 Minimum Solar Reflective Index (SRI) values for different roof types

Roof Type	Slope	Minimum SRI Value	Maximum SRI Value
Low-sloped roof	< 2:12	78	-
Steep-sloped roof	> 2:12	29	64

Note:

- *Exposed roof area does not include equipment platforms, areas with Solar Photovoltaic (SPV) & Solar Water Heaters (SWH), skylights and other service requirements.*
- *Exposed parking area covered with either a metal roof or permanent concrete structure would be considered under the roof area calculation, else parking area would be considered under the non-roof area calculation.*
- *SRI (Solar Reflective Index) value of high reflectance materials should be as per ASTM Standards.*

Non-Roof: **Points: 2**

Implement green measures to minimise Urban Heat Island effect by covering at least 50% of non-roof impervious areas

Provide one or a combination of the following for at least 50% of exposed non-roof impervious areas within the project site:

- Shade from existing tree cover/ newly planted saplings within 5 to 8 years of planting
- Open grid pavers or grass pavers
- Hardscape materials (including pavers) with SRI of at least 29 (and not higher than 64)

Percentage of non-roof area covered with High Reflective Material	Points
> 50%	1
> 75%	2

Note:

- *Non-roof impervious areas include, but not limited to, footpaths, pathways, roads, driveways, uncovered surface parking, and other impervious areas.*

Documentation Required:

(i). Site and Roof plans indicating UHI mitigation measures over roof and non-roof areas.

(ii). Calculations indicating the percentage of area (Roof & Non-Roof) covered by UHI mitigation measures.

(iii). Manufacturer datasheet or Test certificate from a NABL certified test laboratory indicating the SRI value.

(iv). Purchase Invoices of the UHI mitigation measures.

(v). Photographs of UHI mitigation measures implemented.

Exemplary Performance:

This credit is eligible for exemplary performance if the project has implemented UHI measures for 95% of the roof areas.

Green Transportation Facility

SSP Credit 5 **Point: 3**

Intent

To encourage the use of electric and non-fossil fuel vehicles to reduce pollution from automobile use.

Compliance options:

Option-1: Electric Charging Infrastructure **Point: 2**

Provide Electric Vehicle Charging Infrastructure (EVCI) for electric vehicles within the site for at least 10% of the total parking capacity, for both two & four-wheelers.

Percentage of the total parking capacity	Points
10%	1
20%	2

And

Option-2: Eco-friendly Transport Facility **Point: 1**

Provide eco-friendly transport service *(non-fossil fueled vehicles not limited to E-Vehicles, Compressed Natural Gas (CNG), Liquified Natural Gas (LNG), Hydrogen Fuel-cell, Hybrid vehicle, Bicycles, etc.)* for internal or external commutes.

Note:

- *The agreement between the project and service provider shall be for at least three years.*
- *Fast charging can be considered for multiple uses based on their usage in 12 hrs of a day.*

Documentation Required:

(i). Provide parking plan and calculations demonstrating credit compliance.

(ii). Purchase Invoice (PI) of EVCI indicating type and number of charging points installed.

(iii). Cut sheet/ specifications and photographs of charging points provided.

(iv). Provide a copy of the PI/agreement clearly indicating the type of vehicle, fuel used, seating capacity and photographs.

Exemplary Performance:

This credit is not applicable for exemplary performance under Innovation in Design & Operation.

Universal Design

SSP Credit 6 **Points: 2**

Intent

To ensure that the factory building is user-friendly for differently abled people.

Compliance options:

The factory building design should incorporate the following provisions for differently abled and senior citizens in accordance with the guidelines of the National Building Code (NBC) of India 2016:

- Appropriately designed preferred car parking spaces in areas that have easy access to the main entrance or are closer to the lift.
- Provision for easy access to the main entrance
- Uniformity in flooring level/ramps in the factory areas
- Restrooms (toilets) designed for differently abled people
- Visual warning signages in common & exterior areas

Note: Parking shall be provided near the building entrance for the differently abled person with a maximum travel distance of 30.0 m. from the building entrance

Documentation Required:

(i). Provide Site plan/drawings highlighting design provisions made for differently abled people.

(ii). Provide permanent signage indicating that the space is reserved for wheelchair users.

(iii). Submit photographs of facilities provided along with permanent signages.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Outdoor Light Pollution Reduction

SSP Credit 7 **Point: 1**

Intent

Reduce light pollution to increase night sky access and enhance nocturnal environment.

Compliance Option

Upward Lighting:

Design exterior lighting such that no external light fixture emits more than 5% of the total initial designed fixture Lumens, at an angle of 90 degrees or higher from nadir (straight down).

(AND)

Lighting Power Density:

The lighting power density should be reduced by 30% for building facades and exterior areas vis-à-vis the ASHRAE Standard 90.1-2016 baselines, Section 9.4.2-2 - Individual Lighting Power Allowances for Building Exteriors (tradable & non-tradable surfaces).

Notes:

- *Total initial designed fixture Lumens shall be based on the total of all fixtures installed on site.*
- *Classify the project under one of the lighting zones, as defined in ASHRAE Standard 90.1-2016, and follow all the requirements of the respective zones.*

Documentation Required:

(i). Provide lighting drawings indicating the location and type of fixtures used in the project.

(ii). Provide the list of lighting fixtures with make and model, photometric data, including exterior Lighting Power Density (LPD) calculations.

(iii). Provide photographs of exterior lighting fixtures (day and night time).

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Awareness on Green Concepts

SSP Credit 8 **Point: 1**

Intent

To promote environmental awareness among occupants, staff, and visitors to ultimately contribute to positive environmental outcomes

Compliance Options:

Green Education Activities

Demonstrate compliance through at least two of the following green education activities/ programmes, to increase awareness of eco-friendly practices among the building occupants and visitors:

- Develop promotional materials (posters, brochures, etc.) and information.
- Install permanent educational signage in common areas with green concepts
- Organise at least two outreach/educational programmes in a year on eco-friendly practices/ green initiatives.

Documentation Required:

(i). Submit a narrative describing the measures implemented for the Green Education program.

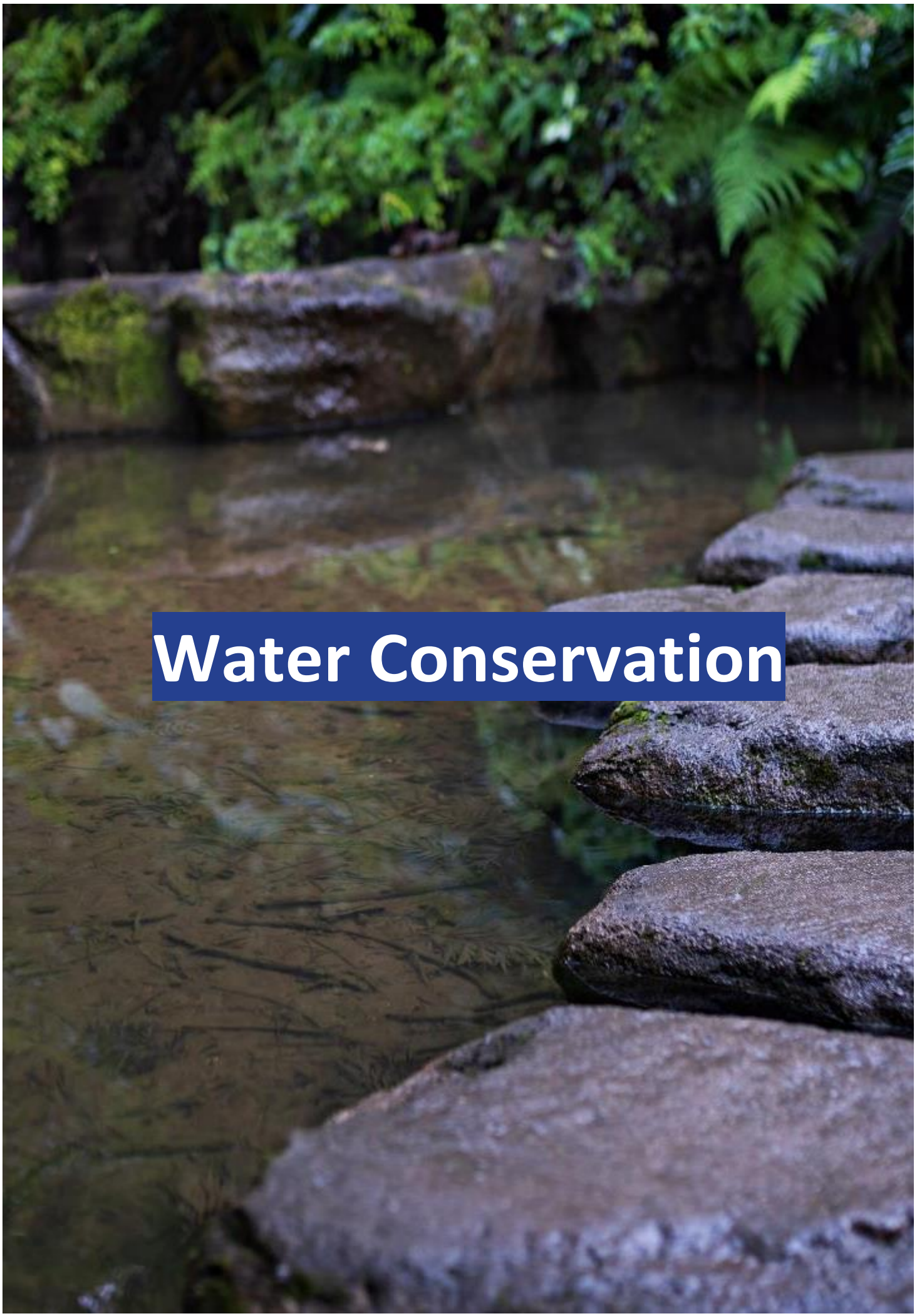
(ii). Submit photographs showing signage and posters placed in the project.

(iii). Provide details of outreach/ educational programmes on eco-friendly practices/ green initiatives, as applicable.

(iv). Presentation/poster on green features implemented in the project.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.


Water Conservation

Rainwater Harvesting

Mandatory Requirement 1

Intent

To increase the groundwater table or to reduce water demand through effective and appropriate rainwater management.

Compliance Options:

Case A: Rainwater Harvesting, Roof & Non-roof

Provide rainwater harvesting system to capture at least 'one-day rainfall*' runoff volume from roof and non-roof areas.

Table 2 Criteria to arrive at "One-day Rainfall"

S No	Average Peak Month Rainfall (in mm)	One-day Rainfall (% of Average Peak Month Rainfall)
1	Upto 500	6%
2	501 – 700	4.5%
3	701 & above	3%

Case B: High Groundwater Table

Projects are exempted from mandatory compliance in areas where the Central or State Ground Water Board does not recommend artificial rainwater recharge or if the groundwater table is below 8 meters.

Notes:

- For rainfall information, refer Indian Meteorological Department (IMD) at http://www.imd.gov.in
- Runoff volume = Surface area x Runoff Coefficient x One-day Rainfall*.

  **One-day rainfall can be derived from the 'percentage of average peak month rainfall' given in Table 2. Peak month rainfall shall be determined by averaging the peak month rainfall of the last five years.*
- In areas where water percolation is limited, rainwater harvesting tanks/ponds shall be provided to meet the above requirement.
- Filtering of suspended solids shall be ensured by providing suitable filtering media before letting the water into the collection tanks, water bodies, and municipal stormwater drains.
- Centralised rainwater harvesting is encouraged in an industrial city, Industrial Park/Corridor/Zone/SEZ projects wherein the project has an approved rainwater/stormwater system.

Table 3 Runoff coefficients for Typical Surface Types

•

S.No.	Surface Type	Runoff Coefficient
1	Cemented / Tiled Roof	0.95
2	Roof Garden (<100 mm thickness)	0.95
3	Roof Garden (100 – 200 mm thickness)	0.30
4	Roof Garden (201 – 500 mm thickness)	0.2
5	Roof Garden (≥ 500 mm thickness)	0.1
6	Turf, Flat (0 – 1% slope)	0.25
7	Turf, Average (1 – 3% slope)	0.35
8	Turf, Hilly (3 – 10% slope)	0.4
9	Turf, Steep (≥ 10% slope)	0.45
10	Vegetation, Flat (0 – 1% slope)	0.1
11	Vegetation, Average (1 – 3% slope)	0.2
12	Vegetation, Hilly (1 – 3% slope)	0.25
13	Vegetation, Steep (≥ 10% slope)	0.2
14	Concrete Pavement	0.95
15	Gravel Pavement	0.75
16	Open –grid Concrete Pavement	0.75
17	Open –grid Concrete Pavement	0.5

Documentation Required:

Case A:

(i). Site plan highlighting the location of RWH system (tank, recharge pit, pond etc.) along with cross-sectional drawing and photographs.

(ii). Submit rainwater harvesting design document including roof catchment gutters, down pipes rainwater, storm water drains, trenches, filter chamber, storage tanks/pits/ sumps.

(iii). Provide rainwater harvesting calculation demonstrating the mandatory compliance.

Case B:

Hydrology report (approved by third party) indicating the level of water table, at different locations within the project site.

Water Efficient Plumbing Fixtures

Mandatory Requirement 2

Intent

To enhance the water efficiency of the factory, thereby reducing dependence on potable water

Compliance Options

Use water-efficient plumbing fixtures whose flow rates meet the baseline criteria in aggregate. The total annual water consumption of the factory should not exceed the total base case water consumption.

Table 4 Baseline Water Consumption for Fixtures at 4 bar pressure

S. No	Fixture type	Maximum Flow Rate*	Duration	Estimated Daily Uses per FTE **
1	Water Closets (Full-flush)	6 LPF	1 Flush	1 for male and female
2	Water Closets (Half-flush)	3 LPF	1 Flush	2 for female
3	Urinals	3.8 LPF	1 Flush	2 for male
4	Faucets/ taps	6 LPM	15 seconds	4
5	Showers/ Handheld Spray	10 LPM	8 minutes	0.1
6	Health Faucets	6 LPM	15 seconds	1

Source: Uniform Illustrated Plumbing Code of India (UPC)-2022.

Notes

- **The baseline flows can be demonstrated at flowing water pressure of 4 bar. Flowing water pressure of 4 bars does not mean that the water supply in the building is at 4 bar. The building fixtures can operate at lower pressures but to show compliance under this credit, the design flow rates are to be submitted at 4 bar.*
- *** Full Time Equivalent (FTE) represents a regular occupant who spends 8 hours per day in the factory/building. Visitors, part-time or employees working overtime, have FTE values based on their hours per day divided by 8.*
- *Plumbing water fixtures include but not limited to faucets/taps installed for hand washing in restrooms and canteens; dish washing and washing clothes shall be considered for calculation. However, water fixtures do not include irrigation applications.*
- *Default occupancy shall be considered as 50% for male and female.*

Document Required:

(i). Submit water saving calculations clearly indicating baseline and design water consumption considering the FTE occupancy (for occupants and visitors).

(ii). Provide a list of plumbing fixtures installed along with manufacturer cut sheets indicating the flowrates at 4 bar flowing water pressure.

(iii). Purchase Invoice and photographs of installed water fixtures indicating the make & model.

Sustainable Landscape Design

WC Credit 1 **Points: 3**

Intent:

Design landscapes to ensure minimum water consumption, thereby reducing dependence on potable water.

Compliance Options:

Limit use of turf on the site to conserve water and/or ensure that the landscaped area is planted with drought tolerant/native/adaptive species.

Points are awarded as below:

Type of Landscape	Percentage of the Total Landscaped Area	Points
Turf Area	≤ 30%	1
	≤ 20%	2
Drought Tolerant/Native/Adaptive Species Area	≥ 30%	1

Notes:

- *Landscape areas shall be considered as per the guidelines defined in SSP Credit 2: Natural Topography.*
- *This credit is applicable only to projects with landscape areas covering at least 15% of the total site area.*
- *The landscape here refers to soft landscaping, which includes only previous vegetation.*
- *Drought-tolerant species are those species that do not require supplemental irrigation. The generally accepted time frame for temporary irrigation is 1 - 2 years.*
- *Areas planted with turf should not exceed a slope of 25 percent (i.e., 4 to 1 slope).*

Documentation Required:

(i). Landscape plan(s) highlighting the area covered with turf, drought tolerant species & other plant species, on the ground and over built structures.

(ii). Calculations indicating the total landscape area, turf and drought tolerant/native/ adaptive species (on the ground and over built structures) to the total site area, in percentage.

(iii). List of turf, drought tolerant, native and adaptive species used in the project.

(iv). Photographs showing the landscaped areas.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation if project has more than 75% of the landscaped area planted with drought-tolerant/native/adaptive species, or 10% of the total landscaped area with source fruit/vegetable-bearing plants.

Management of Irrigation System

WC Credit 2 **Points: 2**

Intent

Reduce the demand for irrigation water through water-efficient management, thereby reducing the use of potable water.

Compliance Option-1

Provide or install efficient irrigation systems incorporating the features mentioned below:(1 Credit Point for every two measures):

- Provide central shutoff valve
- Pressure regulating device(s) to maintain optimal pressure to prevent loss
- Install time-based controller for the valves
- Each type of bedding must be segregated into independent zones based on watering needs.
- Any other innovative methods adopted for irrigation

Notes:

- *Landscape areas shall be considered as per the guidelines defined in SSP Credit 2: Natural Topography.*
- *This credit is applicable only to projects with landscape areas covering at least 15% of the total site area.*

Documentation Required:

(i). Landscape plan highlighting the irrigation systems along with photographs.

(ii). Provide a copy of purchase invoices of installed irrigation systems.

(iii). Provide a detailed description of the management of installed irrigation systems.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation

Enhanced Rainwater Harvesting

WC Credit 3 **Points: 4**

Intent

To increase the groundwater table or to reduce water demand through effective and appropriate rainwater management.

Compliance Options

Case A: Rainwater Harvesting, Roof & Non-roof

Provide rainwater harvesting systems (storage/percolation pit/water harvesting pond or combination) to capture run-off volume greater than 'one-day rainfall' as specified in Table 5.

Table 5 Criteria to arrive at "One-day Rainfall"

S No	Average Peak Month Rainfall (mm)	One-day Rainfall (% of Average Peak Month Rainfall)		
		2 points	3 points	4 points
1	Upto 500	8%	10%	12%
2	501 – 700	6%	7.5%	9%
3	701 & above	4%	5%	6%

Case B: High Groundwater Table

In areas where the Central or State Ground Water Board does not recommend artificial rainwater recharge, or if the groundwater table is below 8 meters. The credit shall be awarded based on the run-off volume captured.

Table 6 Criteria to arrive at "One-day Rainfall"

S No	Average Peak Month Rainfall (mm)	One-day Rainfall (% of Average Peak Month Rainfall)		
		2 points	3 points	4 points
1	Upto 500	4%	6%	8%
2	501 – 700	3%	4.5%	6%
3	701 & above	2%	3%	4%

Notes:

1. *Project in the area which has high water table (less than 8 meter) are not exempted for this credit.*
2. *The captured rainwater shall be used for useful purposes to reduce the dependency on potable water demand.*

Documentation Required:

(i). Provide rainwater harvesting calculations indicating run-off volume captured or harvested from roof or non-roof.

(ii). Site plan highlighting the location of RWH system (tank, recharge pit, pond etc.) along with cross-sectional drawing and photographs.

(iii). Submit rainwater harvesting design document including roof catchment gutters, downpipes rainwater, storm water drains, trenches, filter chamber, storage tanks/ pits/ sumps.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation by providing rainwater systems to capture run-off volume greater than 'one-day rainfall' as specified in Table 7.

Table 7 Criteria to arrive at "One-day Rainfall" for exemplary performance

S No	Average Peak Month Rainfall (mm)	One-day Rainfall (% of Average Peak Month Rainfall)	
		Case A	Case B
1	Upto 500	14%	10%
2	501 – 700	11%	8%
3	701 & above	8%	6%

Wastewater – Treatment

WC Credit 4 **Points: 1**

Intent

Treat wastewater so as to be fit for reuse, thereby reducing dependence on potable water.

Compliance Options:

Waste Water Treatment **Points: 1**

Provide an on-site wastewater treatment system to treat 100% of wastewater generated in the factory building/campus to the quality standards suitable for reuse as prescribed by Central (or) State Pollution Control Board, as applicable.

Notes:

- *Wastewater here refers to both grey and black water.*
- *In cases where the project is located within an industrial park with the facility to divert wastewater to a centralized or common wastewater treatment plant. The credit compliance can be demonstrated by diverting the wastewater.*

Documentation Required:

(i). Provide a detailed water balance calculation and corresponding chart for a typical day and annual usage.

(ii). Provide a detailed description of the installed wastewater treatment system, along with the test/commissioning report as applicable.

(iii). Submit photographs of the wastewater treatment system.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Water Metering and Management

WC Credit 5 **Points: 2**

Intent:

To encourage water use monitoring to identify improvement opportunities, thereby reducing potable water demand.

Compliance Options:

Realtime Water Monitoring **Points: 2**

Demonstrate water monitoring by installation of sub-meters for at least 80% of the total water consumption in the project for various applications, including potable and treated water, as applicable.

$$\%\ use\ of\ \text{water metered} = \frac{\text{Total water metered for different end use}}{Total\ water\ Consumption}$$

Points are awarded as follows:

Percentage of water metered for different end uses:	Points
≥ 80%	1
≥ 90%	2

Documentation Required:

(i). Submit daily and annual water balance for the project, including water demand for landscaping, flushing and air-conditioning cooling tower make-up water and any other major source of water consumption.

(ii). Submit purchase invoices for the installed submeters, along with technical cut sheets and/or meter data log sheets indicating the quantity of water used for each application.

(iii). Schematic diagram showing the location of water meters installed in the project.

(iv). Photographs of meters installed.

Exemplary Performance:

This credit is eligible for exemplary performance in the Innovation in Design & Operation category by implementing an online water monitoring system with a dashboard.

Enhanced Water Efficiency

WC Credit 6 **Points: 4**

Intent

To enhance the water efficiency of the factory, thereby reducing dependence on potable water

Compliance Options:

Option 1: Savings through Individual Water Fixtures

Select the water efficient fixtures with individual flow and flush rates (to calculate the water savings) are as indicated in the table below:

Table 8 Baseline Flow Rates for Water Fixtures

S No	Fixture type	Maximum Flow Rate*	Duration	Estimated Daily Uses per FTE **
1	Water Closets (Full-flush)	6 LPF	1 Flush	1 for male and female
2	Water Closets (Half-flush)	3 LPF	1 Flush	2 for female
3	Urinals	3.8 LPF	1 Flush	2 for male
4	Faucets/ taps	6 LPM	15 seconds	4
5	Showers/ Handheld Spray	10 LPM	8 minutes	0.1
6	Health Faucets	6.0 LPM	15 seconds	1

** At a flowing water pressure of 4 bar*

Source: Illustrated Uniform Plumbing Code of India

The points are awarded as specified as below:

Percentage of Potable Water Savings over Baseline	Credit Points
≥ 15 %	1
≥ 20 %	2
≥ 25 %	3
≥ 30 %	4

Notes:

- *The baseline flows shall be demonstrated at flowing water pressure of 4 bar. Flowing water pressure of 4 bar does not mean that the water supply in the building is at 4 bar. The building fixtures can operate at lower pressures but, to show compliance under this credit, the design flow rates are to be submitted at 4 bar.*
- *Water fixtures do not include irrigation applications.*
- *It's recommended for the water fixtures to be eco-labelled and meet the technical requirements specified above for compliance.*

Documentation Required:

(i). Submit water-saving calculations clearly indicating baseline and design water consumption, considering the FTE occupancy (for occupants and visitors).

(ii). Provide a list of plumbing fixtures installed, along with manufacturer cut sheets indicating the flow rates at 4 bar flowing water pressure.

(iii). Purchase Invoice and photographs of installed water fixtures indicating the make & model.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation if the project demonstrates water saving of 35% or more over the baseline criteria.

Alternative Water Consumption

WC Credit 7 **Points: 4**

Intent

To encourage the use of alternate water so as to reduce dependence on potable water

Compliance Options

Demonstrate alternate water use for at least 40% of the total water consumption in the project for various applications, including flushing, irrigation, domestic use, cooling tower make-up water etc.

$$\text{\% use of Alternate water (Water Performance Ration)} = \frac{\text{Alternate Water Consumption}}{\text{Total water Consumption}}$$

Points awarded are as follows:

Water Performance Ratio (% Alternate Water to Total Water Consumption)	Credit Points
40	1
50	2
60	3
70	4

Notes:

- *Use of alternate water includes rainwater (captive use), treated wastewater, condensate water, and procured treated wastewater.*
- *Treated wastewater sourced from other sites / local authorities through permanent piped connections or other means can also be considered to show compliance for 'alternate water'.*
- *The water requirement and average number of watering days for landscaping shall be considered as 6 liters per sq.m. per day (i.e. 6 litres/sqm/ day) for turf and 2 litres per sqm per day for a minimum of 300 days, (or) justify if the water requirement and the average number of watering days for landscaping is less than the above requirement.*

Documentation Required:

i.) Submit a detailed calculation demonstrating compliance for WPR.

ii.) In case of any purchased wastewater, provide the agreement copy indicating the quantity of wastewater for daily and annual uses.

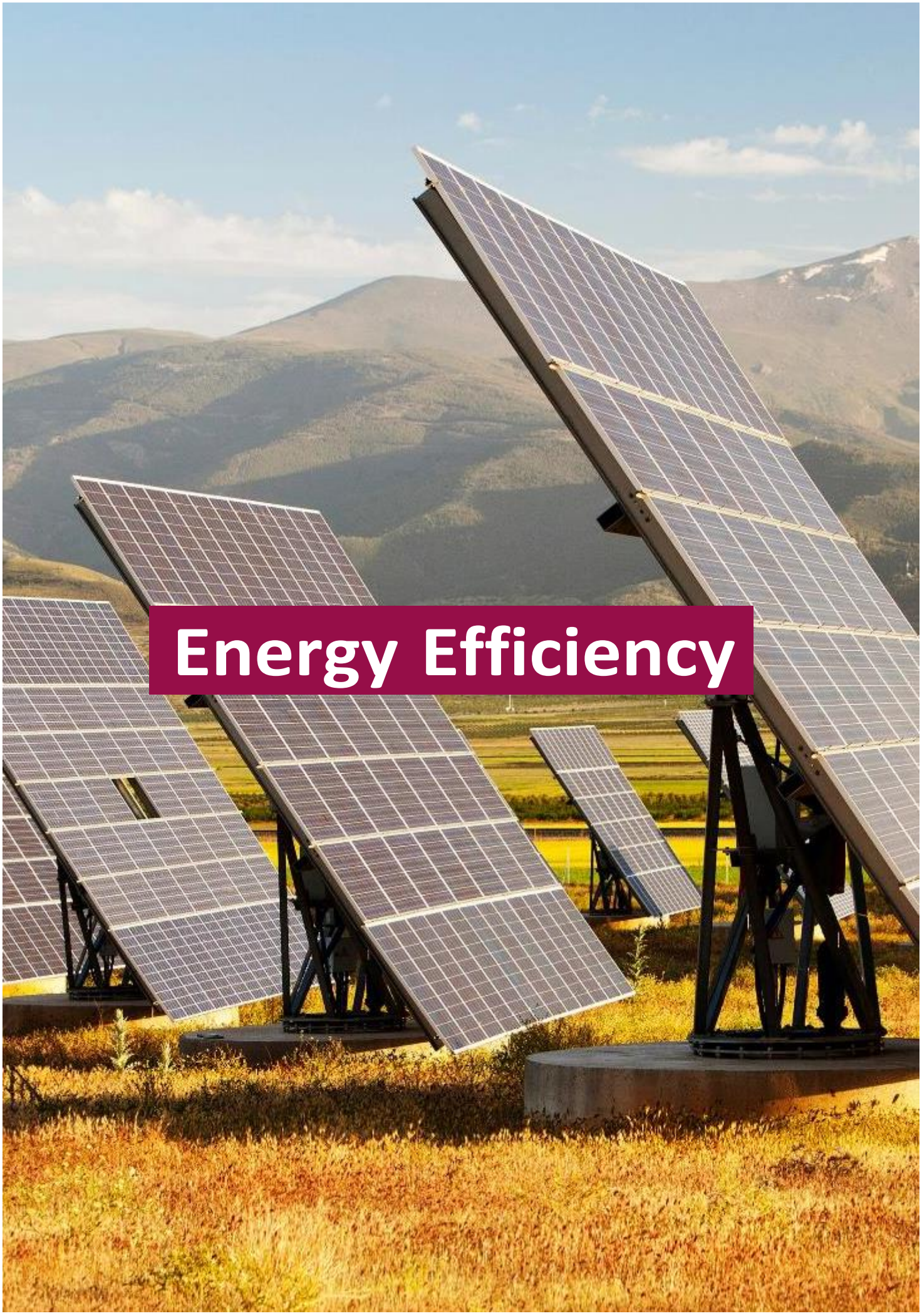
iii.) Provide a detailed water balance calculation and corresponding chart for typical day and annual usage.

iv.) Submit water balance for the project, including water demand

v.) Schematic drawing showing the plumbing lines connected to flush fixtures, cooling tower and landscaping if treated wastewater is reused for these applications.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation if the water performance ratio is greater than 75%


Energy Efficiency

Eco-friendly Refrigerant

Mandatory Requirement 1

Intent:

Encourage the use of eco-friendly refrigerants and gases, that do not deplete the ozone layer and negatively impact the environment.

Compliance Options

Refrigerant/gases used in Heating, Ventilation & Air-conditioning (HVAC) and fire suppression system shall be Zero ODP (Ozone Depleting Potential).

Notes:

- *In an existing factory building project wherein ODP-based refrigerant/gases are still used, the phase-out plan shall be submitted.*
- *New building/factory projects shall only use refrigerant/gas that has Zero ODP to demonstrate compliance.*

Documentation Required:

i.) Provide a comprehensive list of HVAC&R equipment installed in the factory along with the details of refrigerant, technical specifications/ manufacturer cut sheets and photographs of the equipment.

ii.) Submit a declaration letter mentioning that the ODP-based refrigerant/gases are not used in HVAC&R equipment and fire suppression systems.

Minimum Energy Performance

Mandatory Requirement 2

Intent:

Improve energy efficiency for non-process use in the factory building(s) to reduce environmental impacts from excessive energy consumption

Compliance Options:

Demonstrate compliance for the proposed factory building as per ASHRAE 90.1 – 2016 for building blocks in the project through following any of the compliance methods:

- **Option-1: Prescriptive Method**
- **Option-2: Whole Building Performance Method**

Option-1: Prescriptive Method

The Factory buildings shall meet the following prescriptive measures, as applicable:

1) Building Envelope:

Envelope Component	Air-Conditioned Spaces	Other Spaces
Overall Roof Assembly U-value (W/m2K)	1.2	1.5
Overall Wall Assembly U-value (W/m2K)	1.5	2.2
Solar Heat Gain Coefficient All Climates except Cold (non-north façade)	0.40 (WWR < 40%)	0.6 (WWR < 40%)
	0.35 (WWR > 40%)	0.5 (WWR > 40%)
Solar Heat Gain Coefficient (Cold Climate)	0.8	0.8

Notes:

- *For Climatic Zones of India, please refer to Annexure - I.*
- **Low SHGC value can be achieved through chajjas or other sun shading devices or efficient fenestration, or a combination of both. For details, refer NBC 2016 Vol2 Part 11 – Approach to Sustainability, Annex B-3 Table 11&13.*

2) Lighting:

The Lighting Power Density (LPD) in the building interior, exterior and parking areas shall be reduced by a minimum 10% over ASHRAE 90.1 2016/NBC 2016.

Notes:

- *The LPD should include the power consumption of the complete fixture, including lamps and ballasts.*

3) Air-conditioning Systems:

The project shall meet the following requirements, as per the type of air conditioning system:

a) Unitary, Split, Packaged Air Conditioners

Unitary, Split, and Packaged Air-Conditioners shall meet or exceed the efficiency requirements as per the following table:

Cooling Capacity (kWr)	Water Cooled	Air Cooled
≤ 10.5	NA	BEE 3 Star
>10.5	3.3 EER	2.8 EER

b) Chillers

Chillers shall be 2 STAR rated or equivalent as per the BEE Star Labelling programme.

Option-2: Whole Building Performance Method

Demonstrate compliance of the building performance by whole building simulation, as per the baselines outlined in NBC 2016 (or) ASHRAE Standard 90.1-2016.

Notes:

- *A calibrated simulation approach shall be followed in case of existing factory project to demonstrate compliance under Option-2.*
- *Onsite Renewable Energy (RE) shall not be considered in the energy saving calculation.*
- *Simulation shall be carried out for thermostat settings essential for process or as per the recommendation of ECBC 2017.*
- *All the process loads are to be factored in both the base and proposed case. However, process loads can be excluded while reporting the building energy savings.*
- *Interior, exterior, common, and parking area lighting shall be calculated separately.*
- *LPD calculations should include power consumption of complete fixture, including lamps and ballasts.*

Documentation Required

Option 1: Prescriptive Method

1. Construction details and sectional drawings of the wall and roof assembly (including insulation material, etc.,), along with the U-value calculation.
2. Specification of the glazing (SHGC value, U-value and VLT) along with purchase invoice.
3. Window-to-wall ratio (WWR) calculations for each building.
4. Detailed LPD calculations along with the lighting layout.
5. Specifications of the lighting systems and controls, including the list of lighting fixtures with purchase invoice.
6. Specifications of the air-conditioning system indicating the COP/ EER, along with purchase invoice.

Option 2: Whole building Performance Method

1. Comprehensive energy simulation report demonstrating compliance with energy efficiency along with supporting documents, i.e.. Purchase invoices, technical specifications for building envelopes and electrotechnical equipment.
2. Summary describing the results of the analysis, including the annual energy use for the Proposed Design and the Baseline design, and software used.
3. Brief description of the project with location, number of stories, space types, conditioned and unconditioned areas, hours of operation.
4. List of the energy-related building features of the Proposed Design. This list shall also document features different from Baseline design.
5. The input and output report(s) from the simulation program, including a break up of energy usage by all the electro-mechanical components, such as HVAC systems (space cooling, space heating, fan, pumps and heat rejection systems, etc.), lighting, and internal equipment. The output reports shall also show the number of hours any loads which are not met by the HVAC system for both the Proposed Design and Baseline design.
6. Explanation of any significant modelling assumptions made.
7. Explanation of any error messages noted in the simulation program output.
8. Building floor plans, building elevations, and site plan.

Commissioning Plan for Building Systems

Mandatory Requirement 3

Intent:

Verify and ensure that the project's non-process equipment & systems are commissioned to achieve performance as envisaged during the design stage

Compliance Options:

The project shall comply with the following requirements as per the scope:

Demonstrate that the project has signed an agreement with a third-party commissioning authority, not involved in the design. The commissioning authority is required to have at least 3 years of prior experience in equipment & systems.

Notes:

- This credit is not applicable for Existing Factory Buildings.
- *Air-conditioned buildings with unitary, split and standalone systems are exempted*
- *Non-air-conditioned Buildings: For non-air-conditioned projects, the owner or the designer can submit the commissioning plan.*
- Commissioning plan to evaluate the building for its factory building performance *after occupancy, with regard to the following systems (non-process):*
  - *HVAC systems - chiller, VRV systems, primary & secondary water pumps, cooling tower, AHU fans, fresh air fans and flow settings, fresh air treatment units, heat recovery wheel, VFDs and Temperature & RH measurements in individual spaces*
  - *Pumps & motors*
  - *Lighting systems*
  - *Renewable energy systems*
  - *CO2 monitoring system*
  - *Energy & Water metering*
  - *Energy management system*
  - *DG sets or Back-up systems*
  - *Sewage treatment plant – Pumps and Motors*
  - *Any other energy-consuming equipment and systems (Non-process)*

Documentation Required:

i. Copy of an agreement signed between the owner and the third-party commissioning authority, highlighting the period of contract, along with the scope of work.

ii. Commissioning plan describing how the factory building would be audited for its building performance after occupancy, with regard to the equipment and systems.

iii. Commissioning report on green factory building performance of the equipment & systems listed in the commissioning plan. The report for each of the equipment & systems should cover the following:

- Equipment specifications
- Test results with specific comments from the Commissioning Authority, at the time of commissioning
- Key monitoring aspects to sustain performance
- Estimated energy & water consumption
- Scope for performance enhancement in future, and savings thereof

Eco-friendly Refrigerant Management

EE Credit 1 **Point: 1**

Intent

To encourage use of eco-friendly refrigerant/substances having lower global warming impact, thereby reducing the negative impacts on environment.

Compliance Options

Demonstrate that refrigerants used in the buildings Heating, Ventilation & Air-conditioning (HVAC) equipment are eco-friendly and have no Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

The projects HVAC equipment must comply with the following formula, which sets a maximum threshold for the combined contributions to ozone depletion and global warming potential:

$$LCGWP + LCODP \times 10^5 \leq 13$$

LCODP	=	*[ODPr x (Lr x Life +Mr) x Rc]/Life*
LCGWP	=	*[GWPr x (Lr x Life +Mr) x Rc]/Life*
LCODP	:	*Lifecycle Ozone Depletion Potential (kg CFC 11 / kW-Year)*
LCGWP	:	*Lifecycle Direct Global Warming Potential (kg CO2 / kW-Year)*
GWPr	:	*Global Warming Potential of Refrigerant (0 to 12,000 kg CO2 / kg r)*
ODPr	:	*Ozone Depletion Potential of Refrigerant (0 to 0.2 kg CFC 11 / kg r)*
Lr	:	*Refrigerant Leakage Rate (0.5% to 2.0%; default of 2% unless otherwise demonstrated)*
Mr	:	*End-of-life Refrigerant Loss (2% to 10%; default of 10% unless otherwise demonstrated)*
Rc	:	*Refrigerant Charge (0.065 to 0.65 kg of refrigerant per kW of gross AHRI rated cooling capacity or Eurovent certified cooling capacity)*
Life	:	*Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)*

Notes:

- For multiple types of equipment, a weighted average of all base building HVAC&R Equipment must be calculated using the following formula:

$$\Sigma \frac{(LCGWP + LCODP \times 105) \times Q_{unit}}{Q_{total}} \leq 13$$

Q_{unit} = *Eurovent Certified cooling capacity of an individual HVAC or refrigeration unit (kW) (or) Gross AHRI rated cooling capacity of an individual HVAC or refrigeration unit (kW)*

Q_{total} = *Total Eurovent Certified cooling capacity of all HVAC or refrigeration (kW) (or) Total gross AHRI rated cooling capacity of all HVAC or refrigeration*

- *Small HVAC units (containing less than 0.25 kg of refrigerant) need not be considered in the calculation.*

Documentation Required:

Calculations indicating the combined contributions of the refrigerant installed in the HVAC system to ozone depletion and global warming.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation if the average GWP of refrigerant used is less than 500.

Enhanced Energy Performance

EE Credit 2 **Points: 12**

Intent

Optimise energy efficiency for non-process use in the factory building to reduce environmental impacts from excessive energy consumption.

Compliance Options:

The project can choose any one of the following options, as applicable, to demonstrate compliance:

- Option 1 - Prescriptive Approach
- Option 2 - Simulation Approach

❖ Option 1 - Prescriptive Approach:

Demonstrate that the project is able to enhance energy efficiency in the building by meeting the minimum (or maximum) values prescribed in Credit 2.1 to Credit 2.4.

Credit 2.1: Efficient Building Envelope **Points: 3**

Demonstrate the excellence in energy efficiency of building an envelope by meeting the specified requirements at the following envelope component level.

Envelope Component	Air-Conditioned Spaces	Other Spaces	Credit Points
Overall Roof Assembly U-value	0.6 W/m^{2}K	1.0 W/m^{2}K	1
	0.3 W/m^{2}K	0.5 W/m^{2}K	2
Overall Wall Assembly U-value	0.75 W/m^{2}K	1.5 W/m^{2}K	1
Solar Heat Gain Coefficient All Climates except Cold Climate (non-north façade)	0.3 (WWR < 40%)	0.4 (WWR < 40%)	1
	0.25 (WWR > 40%)	0.3 (WWR > 40%)	

Credit 2.2: Efficient Lighting System **Points: 3**

Demonstrate that the interior lighting power density of the project is reduced by at least 30% over the ECBC 2017 Baseline.

Reduction in LPD & Control	Points
≥ 30% Reduction in LPD	1
≥ 50% Reduction in LPD	2
50% of lighting load shall have automatic control* to reduce lighting energy use	1

*Lighting of all non-emergency exterior & interior areas such as warehouses, staircases, corridors, façade, pathways, should have at least one of the following lighting controls:
1. Daylight Control
2. Occupancy Control

Credit 2.3: Efficient HVAC System **Points: 4**

Use of centralised or unitary air conditioning system to demonstrate the compliance for HVAC System

Case A: Centralised Air Conditioning System

Project should use chillers as per Standards and Labelling Program of BEE. Points are awarded as below:

Star Rating	Points
3 Star	1
4 Star	2
5 Star	4

Note:

When a building is using multiple chillers, the overall energy efficiency rating (COP & ISEER) for compliance can be determined by calculating a weighted average of the energy efficiency ratings (COP & ISEER) of all the chillers and determine the equivalent star rating using the BEE's star labelling system.

OR

Case B: Other HVAC System or Non-conditioned Buildings

Project should use air conditioning system as per Standards and Labelling Program of BEE. Points are awarded as below:

Star Rating	Points
4 Star	1
5 Star	2
HVLS Fans	1
Evaporative Cooling System	1

Credit 2.4: Low Energy Cooling System **Points: 2**

Install/implement any of the following low-energy comfort systems in place of (or in conjunction with) refrigerant-based cooling systems.

1. Desiccant cooling system
2. Radiant cooling system
3. Solar air conditioning
4. Ground source heat pump
5. Tri-generation (waste-to-heat)
6. Adiabatic cooling system

❖ Option 2: Simulation Approach

Design the building to be compliant with NBC 2016 or ASHRAE Standard 90.1-2016, Appendix - G through Whole building simulation.

Points are awarded based on energy cost percentage savings as detailed below:

Percentage of Energy Cost Savings over NBC 2016 or ASHRAE Standard 90.1-2016 Appendix G Base case			
% Energy Savings	**Credit points (New)**	**% Energy Savings**	**Credit points (Existing)**
2.5%	1	2%	1
5%	2	4%	2
7.5%	3	6%	3
10%	4	8%	4
12.5%	5	10%	5
15%	6	12%	6
17.5%	7	14%	7
20%	8	16%	8
22.5%	9	18%	9
25%	10	20%	10
27.5%	11	22%	11
30%	12	24%	12

Notes:

- *All the process loads are to be factored in both the base and proposed case. However, process loads shall be excluded while reporting the building energy savings.*
- *Calibrated simulation approach shall be followed in case of existing factory projects to demonstrate compliance.*
- *Onsite Renewable Energy (RE) shall not be considered in energy saving calculation.*
- *Simulation shall be carried out with thermostat settings either recommended for process requirement or as per the NBC 2016 guideline.*

Documentation Required

i.) For option 2 simulation approach, submit energy simulation report according to the documentation required as per EE Mandatory Requirement 2.

ii.) For option 1 prescriptive approach, submit detailed document specifying the different prescriptive measures attempted along with supporting documents as applicable.

Supporting Documents:

- Manufacturer brochures/ data-sheets/ letters/ name plates indicating the efficiency parameters for lighting fixtures, air-conditioning system, fans, pumps & motors, DG sets, distribution transformers, energy saving appliances, as applicable.
- Purchase invoices of energy conservation measures implemented in the project such as wall & roof insulation, glazing & skylights, lighting fixtures, air- conditioning systems,

fans, pumps & motors, DG sets, distribution transformers, energy saving appliances as applicable.

- Photographs of the wall & roof insulation, glazing & skylights, lighting fixtures, air-conditioning system, fans, pumps & motors, DG sets, distribution transformers, energy saving appliances, as applicable
- Drawings/ sketches/ rendered images (such as site plan, floor plans, sections & elevations, images, as applicable) indicating the area covered with pre-cooling or low energy mechanical cooling techniques along with area calculations in percentage.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation, if the minimum energy cost savings for new buildings is over 35% and existing buildings over 26%.

Green Power

EE Credit: 3 **Points: 8**

Intent

To encourage use of renewable energy sources to reduce dependence on fossil-fuel based energy generation

Compliance Options:

Install on-site/offsite renewable energy system to off-set fossil-fuel based energy consumption. Credit points are awarded based on the percentage of total annual non-process energy consumption of the factory building.

The percentage total of onsite/offsite renewable energy to the total annual non-process energy consumption	Credit Points
≥ 30%	1
≥ 40%	2
≥ 50%	3
≥ 60%	4
≥ 70%	5
≥ 80%	6
≥ 90%	7
≥ 100%	8

Notes:

- *On-site energy supply system installation, such as fuel cells will be considered as green source of power.*
- *Energy through biomass would be considered as green power; the project team shall submit a calculation to show equivalent energy generation (use).*

Documentation Required:

i.) Submit site plan showing the location of installed renewable energy systems.

i.) Provide a detailed report with technical details for the off-site renewable energy systems

ii.) Submit the latest copy of the utility/ energy bill indicating the renewable energy.

iii.) Submit purchase invoice of the installed renewable energy systems as applicable.

iv.) Provide calculations indicating the total annual energy generation from the on-site/ off-site renewable energy systems (kWh) or combination of both to the total non-process annual energy consumption of the project.

v.) Submit copy of Power Purchase Agreement (PPA) signed between the project owner/ developer and the green power developer, as applicable.

vi.) Submit photographs showing the on-site renewable energy systems.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Eco-Friendly Captive Power Generation

EE Credit: 4 **Points: 1**

Intent

To reduce dependence on fossil fuels for in-situ power generation, thereby reducing the environmental impacts

Compliance Options:

Project shall use diesel generator sets which are certified by Central Pollution Control Board (CPCB) for emissions and noise compliance. For compliance, generator set shall meet the following criteria:

- Compatibility with biofuels or non-edible oils or any other non-fossil-based fuel for captive power generation.
- LPG /CNG fuelled Generator set or bio-diesel blend (for at least 5%) are also acceptable for compliance.

Note:

- *This credit point is applicable only if at least 50% of the total load is catered by the DG Set.*

Documentation Required:

i.) Provide manufacturer's cut sheets and purchase invoice of DG Set clearly indicating the type of fuel used and compatibility for using Biodiesel.

ii.) Submit calculations indicating the specific fuel consumption value along with photographs.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Energy Monitoring

EE Credit 5 **Points: 2**

Intent

To encourage continuous performance monitoring and improve energy performance, thereby reducing the environmental impacts.

Compliance Option

Demonstrate that sub-meters are installed to measure end-use energy for the following applications (1 point for every two meters).

- Air-conditioning energy usage
- Internal lighting energy consumption
- External lighting energy consumption
- Btu meter for chilled water consumption
- Energy meter for onsite RE generation
- Energy meter for process energy consumption
- Pumping system (municipal water, grey water, landscaping water)
- Any individual energy end use that constitute at least 10% of total energy use

Documentation Required:

i.) Provide technical cutsheet of submeters along with photographs.

ii.) Submit a single-line diagram (SLD) or schematic diagram of the electrical system, highlighting the location of the meters.

iii.) Submit energy use data for at least the preceding one year in case of existing factory building.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation if the project provides a monitoring system along with dashboards.

Materials & Resources

Waste Management

Mandatory Requirement 1

Intent

To encourage eco-friendly waste management practices, thereby reducing waste going to landfills

Compliance Option:

Implement a waste management policy to ensure proper segregation of all waste types in the factory. Install separate bins (to collect waste such as paper, plastics, metals, glass, e-waste, wet waste, etc.) for all types of waste in the factory premises.

Note:

- *Policy shall also become the guiding document for organisation to set goal for reduction in waste materials and shall encourage reuse, recycling of materials and safe disposal as per the guidelines from Central/State Pollution Control Board. Policy shall include, but not be limited to quantity of waste generated/ recycled/ reused/ disposed on monthly/annual basis.*
- *The project has to follow the Hazardous Waste Management Guidelines as prescribed by the Ministry of Environment & Forest (MoEF), Government of India.*

Documentation Required:

i.) Submit a copy of the Waste Management Policy signed by authorised signatories.

ii.) Submit a narrative and site plan highlighting the areas designated for waste collection, segregation and storage along with permanent signage.

iii.) Provide photographs of waste bins at floor level, common areas and centralised waste collection yard.

Sustainable Procurement

MC Credit 1 **Points: 2**

Intent:

Use certified green building materials, products and equipment so as to reduce negative environmental impact.

Compliance Options:

New Factory **Points: 2**

Ensure that the project procures GreenPro or equivalent eco-labelled products & materials for building construction. The purchased quantity of eco-labelled products to be at least 10% of the total cost of construction.

Note: The project shall develop a Sustainable Procurement Policy following IGBC Green Factory Building Rating System during any construction/renovation/retrofitting/ expansion.

Points are awarded as below:

Percentage of Ecolabelled Products Procured	Points
≥ 10%	1
≥ 20%	2

Existing Factory **Points: 1**

The project shall develop a Sustainable Procurement Policy following IGBC Green Factory Building Rating System during any construction/renovation/retrofitting/ expansion.

Documentation Required:

i.) Submit the calculation demonstrating compliance for Ecolabelled products to the total cost of construction materials procured.

ii.) Provide valid GreenPro certificate or equivalent ecolabelled certificate.

iii.) Submit a sustainable procurement policy signed by authorized signatories.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Organic Waste Management

MR Credit 2 **Points: 2**

Intent:

Encourage effective waste management practices to prevent organic waste from being sent to landfills.

Compliance Options:

Install an on-site organic waste treatment system for handling organic waste generated in the project.

Points are awarded as below:

Organic Waste	Percentage of Waste Treated	Points
Food Waste	≥ 75%	1
Garden waste	≥ 25%	1

Notes:

- *Food waste shall be considered for all factory employees.*
- *The project can also assess opportunities available in the community for the treatment of organic wastes.*

Documents Required:

i.) In case of existing factory buildings, submit the quantity of waste generated and processed/treated on an annual basis.

ii.) Submit the manufacturer's brochure, purchase invoice of the installed organic waste treatment system, along with photographs.

iii.) Submit a calculation showing compliance for organic waste treatment on a daily basis, along with supporting documents to validate the quantity of waste generated.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Construction Waste Management

MR Credit 3 **Points: 2**

Intent:

Facilitate segregation of construction and demolition waste at source to encourage reuse or recycling of materials, thereby avoiding waste being sent to landfills.

Compliance Option:

Waste Reduction

Demonstrate that at least 75% of waste generated during construction is diverted from landfills, for reuse or recycling. Use consistent metrics, either weight or volume, to show compliance.

Points are awarded as below:

Percentage of Construction Waste Diverted	Points
≥ 75%	1
≥ 95%	2

Notes:

- *This credit is not applicable for existing factory building project.*
- *Construction waste here refers to civil & interior building waste.*
- *Excavated earth & stones should not be considered under this credit, as these are natural resources.*

Documentation Required:

i.) Submit calculations indicating the quantity of construction waste generated to the total quantity of construction waste reused, recycled and sent to landfill, in percentage.

ii.) Letters from scrap dealers/ contractors stating the type and quantity of construction waste received/ reused from the project site, for recycling/ reuse.

iii.) Photographs taken at various stages of the project showing the construction waste materials reused in the project.

Exemplary Performance:

This credit is not applicable for exemplary performance under Innovation in Design & Operation.

Materials with Recycled Content

MR Credit 4 **Points: 3**

Intent:
Encourage use of materials which contain recycled content, thereby reducing negative environmental impacts.

Compliance Option
Use materials with recycled content such that the total recycled content constitutes at least 5% of the total cost of the materials used in the project. Points are awarded as below.
Points for Recycled Content:

Percentage of Recycled Content	Points
≥ 5%	1
≥ 15%	2
≥ 25%	3

Notes:

- *This credit is not applicable for the Existing Factory Building Project.*
- *Material Cost = Total Cost – (Labour Cost + Installation Cost)*
- *If the Labour and Installation cost is not known, the default material cost can be considered as 60% of the total cost of the component*
- *Cost of equipment, systems, lighting fixtures, appliances, movable furniture need not be considered in the total material cost*

Documentation Required:

i.) Provide a calculation demonstrating compliance for recycled content to the total cost of construction material.

ii.) Submit project-specific letters from manufacturers or cut sheets/ brochures clearly indicating the percentage of recycled content in the material.

Exemplary Performance:
This credit is eligible for exemplary performance under Innovation in Design & Operation if total recycled content constitutes ≥ 30% of the total cost of the materials used in the project.

Local Materials

MR Credit 5 **Points: 3**

Intent:

Encourage the use of building materials available locally, thereby minimising the associated environmental impacts.

Compliance Option

Ensure that at least 25% of the total factory building materials (by cost), used in the project are manufactured within a radius of 400 km.

Points are awarded as follows:

Percentage of local materials	Points
≥ 25%	1
≥ 50%	2
≥ 75%	3

Note: This credit is not applicable for the existing factory building project.

Documentation Required:

i.) Provide details of all materials used in the project, along with the cost of each material. Additionally, indicate the distance between the manufacturing facility and the project site.

ii.) Submit calculations indicating the cost of local materials sourced to the total materials cost of the project, in percentage.

iii.) Submit project specific letters from manufacturers indicating the quantity of material dispatched/supplied of along with distance between project and manufacturing facility.

Exemplary Performance:

This credit is not applicable for exemplary performance under Innovation in Design & Operation.

Use of Salvaged Materials

MR Credit 6 **Points: 2**

Intent:

Encourage the use of salvaged building materials and products to reduce the demand for virgin materials, thereby minimising the environmental impacts

Compliance Option

Ensure atleast 2.5% of the total cost of the building materials is salvaged, refurbished etc. Points are awarded for use of Salvaged Materials

Percentage of Salvaged Materials Used	Points
≥ 2.5%	1
≥ 5%	2

Note: This credit is not applicable for existing factory building project.

Documentation Required:

i.) Submit the list of the salvaged materials, their applications and source of salvaged material.

ii.) Provide calculations indicating the cost of salvaged materials sourced by the project to the total building materials cost, in percentage.

iii.) Purchase invoice or payment receipts from vendors indicating the present market value (in terms of cost) of salvaged materials used in the project.

iv.) Photographs showing the salvaged materials used (before & after).

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation, if 10% of the total cost of the building materials is salvaged, refurbished, etc.

Eco-Friendly Wood-Based Materials

MR Credit 7 **Points: 2**

Intent:

Minimise the use of new wood-based products, thereby reducing the impacts of deforestation.

Compliance Option

Ensure that at least 75% (by cost) of all wood-based products used in the project are either rapidly renewable, FSC*/PEFC** certified (or equivalent), or derived from composite, agri-based, or recycled wood materials.

Points are awarded as below:

Percentage of Eco Friendly Wood-Based materials	Points
≥ 75%	1
≥ 95%	2

** Forest Stewardship Council (FSC) Programme*

*** Programme for the Endorsement for Forest Certification (PEFC)*

Notes:

- *For assemblies, consider the value of only wood-based materials*
- *Rapidly renewable materials are those that can be harvested and used within a ten year cycle. Example: Bamboo, Eucalyptus, Bagasse-based materials, Jute-based materials, cotton blinds, rubber wood, etc.*
- *Composite/Agri-based wood /Recycled Waste wood examples include (but not limited to) MDF boards, particle boards, linoleum boards, etc.*
- *Salvaged wood-based materials shall not be considered under 'Wood-Based materials' calculations.*

Documentation Required:

i.) Calculations demonstrating compliance for Eco-Friendly Wood-Based Materials.

ii.) Provide a list of rapidly renewable material (and/ or) certified wood by FSC/ PEFC or equivalent used in the project, along with purchase invoices.

iii.) Provide certificates for FSC/ PEFC or equivalent certified wood used materials.

iv.) For FSC-certified wood, provide the Manufacturer's CoC certificate and purchase invoices with CoC number.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Indoor Environment Quality

No Smoking Policy

Mandatory Requirement 1

Intent

Minimise exposure of non-smokers to adverse health impacts arising due to passive smoking.

Compliance Options

Case A : No Smoking

Demonstrate that smoking is prohibited in the project and is in accordance with the regulations of Ministry of Health & Family Welfare, Government of India.

(And / Or)

Case B : Outdoor Smoking Areas

In case the project has assigned outdoor smoking areas, locate such areas at a minimum of 7.6 meters from all outdoor air intakes (entrance doors, window openings, etc.)

(And / Or)

Case C : Designated Smoking Rooms

Alternately, compliance can be shown through designated smoking rooms, which capture and remove tobacco smoke from the building.

Notes for Designing a Smoking Room:

- *The smoking room shall be completely sealed.*
- *The conditioned air entry into the smoking zone shall not return or be transferred to the air-handling units. This air shall be completely exhausted.*
- *The exhaust air louvre/duct should be located at least 7.6 meters away from building entry or fresh air intakes.*
- *The smoking room shall be maintained at a negative pressure of 5 Pascals (0.00005 bar).*

Documentation Required:

(i). Submit organisational/HR policy signed by the authorised signatory indicating that smoking is prohibited in the facility.

(ii). Provide photographs of signage that is permanently installed or displayed at frequently accessed locations within the facility to educate occupants and visitors.

(iii). In the case of designated smoking rooms, submit design details along with photographs to show credit compliance.

Minimum Fresh Air Requirements

Mandatory Requirement 2

Intent

To provide adequate ventilation rates for maintaining indoor air quality, thereby minimising adverse health impacts.

Compliance Options:

Design and install ventilation systems for the regularly occupied spaces of the factory building to meet the criteria below:

For Mechanically Ventilated Spaces

Demonstrate that the fresh air ventilation in all regularly occupied areas meets the minimum ventilation rates, as prescribed in NBC 2016.

For Air-Conditioned Spaces

Demonstrate that the fresh air ventilation in all regularly occupied areas meets the minimum ventilation rates, as prescribed in ASHRAE Standard 62.1 - 2016.

For Non-Air-Conditioned Spaces

Provide operable windows and/or doors to the exterior in all regularly occupied areas, ensuring that the ratio of operable openings to carpet area is at least 2%.

Notes:

- *Windows/doors should not have any obstruction within 2 m from the exterior surface. Shading devices can be excluded.*
- *For sliding windows/doors, only the openable area to the exteriors shall be considered in calculations.*
- *Rolling shutters to the exteriors, which remain open during the working hours of factory can be considered in openable area calculations.*
- *Regularly occupied areas are those where people sit or stand as they work, irrespective of the number of days occupied in a year.*
- *Project shall calculate volume considering the maximum ceiling height as 4.25 meters from the floor.*

Documentation Required:

(i). Provide a design narrative describing the project's ventilation strategy implemented.

(ii). Submit calculations showing compliance with the minimum ventilation requirements.

(iii). Floor plans, elevation drawings and window & door schedule along with the location and photographs of provided ventilation systems.

(iv). Provide technical specifications and purchase invoices of the fresh air systems installed for mechanically ventilated spaces.

Avoid use of Asbestos in the Building

Mandatory Requirement 3

Intent

To encourage factory design that eliminates the risk of major health effects associated with asbestos exposure.

Compliance Options

Eliminate the use of asbestos in new factory building design.

In case of existing buildings, if asbestos is already being used, have a phase-out plan in place.

Documentation Required:

(i). Provide declaration from authorized signatory mentioning that Asbestos has not been in the factory.

(ii). Submit phase out plan (as per PCB/CPCB norms) for existing factory buildings to eliminate exposure of occupants to Asbestos.

Enhanced Fresh Air Ventilation

IEQ Credit 1 Points: 4

Intent

To provide adequate ventilation rates for maintaining indoor air quality, thereby minimising adverse health impacts.

Compliance Options

Install fresh air delivery systems in all the regularly occupied spaces of the factory building to meet the criteria below:

For Air-conditioned spaces, provide ventilation rates higher than those mentioned in IEQ mandatory requirement 2.

The points are awarded as specified below:

Percentage Improvement over Minimum Fresh Air Requirements	Credit Points
≥ 15%	1
≥ 20%	2
≥ 25%	3
≥ 30%	4

For naturally ventilated spaces, comply with the following requirement:

Openings to Carpet Area Ratio	Credit Points
≥ 3%	1
≥ 4%	2
≥ 5%	3
≥ 6%	4

For mechanically ventilated spaces, provide increased Air Changes per Hour (ACH) than those mentioned in IEQ mandatory requirement 2.

Points for providing increased ACH in the occupied spaces

Percentage Improvement over Minimum Air Changes per Hour*	Credit Points
≥ 15%	1
≥ 20%	2
≥ 25%	3
≥ 30%	4

Documentation Required:

(i). Submit calculations showing compliance with the enhanced ventilation requirements.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Building Flush Out

IEQ Credit 2 **Points: 1**

Intent

To avoid occupants' exposure to indoor airborne contaminants, so as to reduce the adverse health impacts on occupants.

Compliance Options:

- **Option-1: Natural Ventilation**

  Before the building is occupied (after paints, adhesives, and sealants have been applied), a building flush-out needs to be conducted for ten days, keeping all windows and doors open.

  And/Or

- **Option-2: Forced Ventilation**

  The project shall perform a building flush out using forced ventilation systems. The ventilation system shall be deployed/installed to replace or flush out indoor air by outdoor air at 6 ACH for 24 hours and shall be continued for at least 5 days.

Note: This credit is not applicable for existing factory building project.

Documentation required:

(i). Provide a narrative along with declaration from authorised signatory describing the flush out procedure along with timestamped photographs.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Low VOC Materials

IEQ Credit 3 **Points: 2**

Intent

Encourage the use of materials with low emissions to reduce adverse health impacts on occupants

Compliance Options:

Use of Eco-friendly Paints and Coatings **Point: 1**

Use paints with low or no VOC content (as specified in the table below) to the extent of 100% of the interior wall surface area.

Table 10 VOC Limits for Paints & Coatings

Type of Paints & Coatings	VOC Limit (g/L less water)
Non-flat (Glossy)	150
Flat (Mat)	50
Anti-corrosive/ Anti-rust	250
Clear Wood Finish: Varnish	350
Clear Wood Finish: Lacquer	550
Floor Coatings	100
Non-flat (Glossy)	150

AND

Use of Eco-friendly Adhesives and Sealants **Point: 1**

Use adhesives and sealants within the interiors which do not exceed the VOC content limits as specified in the table below.

Table 11 VOC Limits for Adhesives

Type of Adhesives	VOC Limit (g/L less water)
Glazing adhesives	100
Ceramic tile adhesives	65
Drywall and panel adhesives	50
Wood substrate adhesives	30
Wood flooring adhesives	100
HVAC duct insulation	400
Indoor Carpet adhesives	50
Multipurpose construction adhesives	70

Documentation Required

(i). Provide a list of low or no VOC content paints, coatings and adhesives (make & model used in the building interiors along with the VOC content (in g/L less water).

(ii). Provide manufacturer cut sheets/ brochures/ material safety data sheets from the manufacturer indicating VOC content in paint, coating and adhesive used in the project.

(iii). Submit purchase invoices for paint, coating and adhesive containers specifying the make & model.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Eco-Friendly Housekeeping Chemicals

IEQ Credit: 4 **Point: 2**

Intent

Encourage the use of eco-friendly housekeeping chemicals to reduce associated adverse health and environmental impacts

Compliance Options

The project shall opt eco-friendly green housekeeping chemicals to ensure a safe and healthy environment for occupants.

The following strategies shall be adopted:

- Procurement of housekeeping chemicals that meet GreenPro or any other equivalent ecolabel products.
- Guidelines for using appropriate disinfectants and sanitizers to provide healthier environmental conditions for building occupants.
- Guidelines for safe storage and handling of housekeeping materials.

Documentation required:

(i). Please submit a signed copy of the policy by an authorised signatory for the procurement of eco-friendly housekeeping chemicals

(ii). Provide manufacturer cut sheets/brochures/material safety data sheets of housekeeping chemicals procured.

(iii). Submit purchase invoices for housekeeping chemicals being used in the project.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Indoor Air Quality

IEQ Credit: 5 **Point: 2**

Intent

To maintain optimal indoor air quality levels in the building to ensure occupant comfort and well-being

Compliance Options

Option-1: Monitor IAQ Parameters **Point: 1**

Measure IAQ parameters in all regularly occupied spaces and ensure that 80% of the measurements are well within the threshold values of Class C as specified in Annexure-II. Points are awarded as follows:

IAQ Parameters	Points
IAQ parameters (CO_2, PM 2.5, CO, TVOC)	1

AND

Option-2: CO2 Monitoring **Point: 1**

Demonstrate that the project has installed CO_2 sensors to maintain a differential CO_2 level of a maximum of 530 ppm in all regularly occupied areas.

Notes:

- *Regularly occupied areas are those where people sit or stand as they work, irrespective of the number of days occupied in a year.*
- *Project shall measure Indoor Air Quality (IAQ) or IAQ testing shall be carried out at least once a year.*
- *Depending upon the building location, interiors and other local factors, pollutants that significantly affect human health should also be considered and the corresponding threshold standard should be referred.*

Documentation required:

(i). Submit a detailed air quality testing report conducted, validated by a third-party testing laboratory (NABL Accredited).

(ii). Submit a report describing the strategies implemented to monitor CO2 levels in each zone.

(iii). Submit purchase invoices & technical specifications of the installed CO2 sensors, along with photographs.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.

Daylighting

IEQ Credit 6 Points: 5

Intent

To ensure providing natural lighting and visual comfort, thereby enhancing connectivity between the indoor & outdoor environment

Compliance Options:

The project shall provide adequate daylighting to meet or exceed the Useful Daylight Illuminance (UDI) between 100 lux and 2000 lux for at least 15% of the total floor area (regularly occupied spaces) for 50% of the potential daylit time in a year. The project may choose one of the following options to show credit compliance.

Table 12 Daylighting for regularly occupied spaces

Percentage of regularly occupied space meeting UDI requirement			Points
Multi floor	Combination	Single floor	
≥ 10%	≥ 20%	≥ 30%	1
≥ 15%	≥ 25%	≥ 35%	2
≥ 20%	≥ 30%	≥ 40%	3
≥ 25%	≥ 35%	≥ 45%	4
≥ 30%	≥ 40%	≥ 50%	5

Option 1: Simulation Approach

The project team shall perform a lighting simulation to demonstrate compliance with the daylighting following UDI concept. The period of analysis shall be fixed for 8 hours per day, anytime between 8:00 AM IST to 5:00 PM IST, resulting in 2,920 hours. For further details, please refer ECBC 2017 (latest version published in Nov 2019).

OR

Option 2: Manual Approach

This method can be used to demonstrate compliance with daylighting requirements manually. Daylight Extent Factors (DEF) shall be used for manually calculating % of above-grade floor area meeting the UDI requirement for 50% of the potential daylit time in a year. For further details, please refer ECBC 2017 (latest version published in Nov 2019).

Notes:

- *Regularly occupied areas include manufacturing zone (shop floor), assembly zone, packing zone, storage area, labs, cabins, workstations, warehouse, meeting rooms, etc.; whereas, areas with audio-visual facilities such as auditoriums, conference rooms, etc., can be excluded from this credit calculation, with justification and supporting documents.*

- *Any space where daylighting will interfere with the functions or processes is exempted in daylight requirement.*
- *Single-floor buildings are those buildings where 100% of the built-up area has exposed roof. Multi-floor buildings are those buildings where 100% of built-up areas span more than one floor. Combination Case should be used for buildings where the built up area has certain portions with exposed roof while other sections comprise multiple floors.*

Documentation Required:

i. Daylight simulation report (for simulation approach) with sky conditions (such as date & month, time, ambient Lux levels) and wall, floor & roof reflectance properties, for all the regularly occupied spaces in the building.
   - Summary describing the results of the analysis and output file from simulation tool outlining point wise compliance for the analysis grid and compliance in percentage.
   - Explanation of any significant modelling assumptions made.
   - Explanation of any error messages noted in the simulation program output.
   - Building floor plans, building elevations & sections, and site plan with surrounding building details (if modeled).
   - Material reflectance, analysis grid size, total number of grid size/resolution, total number of grid points.
   - During simulation, consider shading devices and 'shadow effect' of adjacent buildings.

ii. Daylight Analysis report/daylight extent factors (for manual approach) indicating the illuminance levels at work plane height for all the regularly occupied spaces

iii. Floor/ roof plans with window and skylight schedule.

iv. Manufacturer brochure/ cut-sheet/ letter of the glass installed showing the Visual Light Transmittance (VLT).

v. Photographs showing the building elevations (all sides) and interior spaces at different floors.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation in Design & Operation, more than 60% of regularly occupied area meeting the UDI requirement.

Occupant Well-being Facility

IEQ Credit: 7 **Points: 2**

Intent

Provide facilities for the workforce to minimise fatigue, thereby improving health and well-being

Compliance Options

Option-1: Indoor and Outdoor Games **Point: 1**

Provide at least three indoor (and/or) outdoor games to reduce workmen fatigue.

Table 13 List of indoor and outdoor games (list is illustrative only)

Indoor Games		Outdoor Games	
(i).	Table tennis	(i).	Badminton Court
(ii).	Carrom board	(ii).	Volleyball Court
(iii).	Squash	(iii).	Basketball Court
(iv).	Foos ball	(iv).	Tennis Court
(v).	Air hockey	(v).	Football/Cricket Ground
(vi).	Snooker, etc.	(vi).	Kabaddi, etc.

And/or

Option-2: Break Out Space **Point-1**

Provide breakout spaces within the factory campus to cater to 5% of the regular employees pershift. The spaces should be located within a walkable distance of 0.3 km from the shop floor.

Notes:

- *Definition of Break-out Space: A quiet area away from the bustle of the workplace where informal meetings can be held, or just a space for staff to take a break to relax or overcome fatigue. Break-out space shall be shaded and usable during rainy/harsh summer or winter conditions.*
- *Break-out spaces shall be distinct areas, separate from the shop or work floor, and not located within circulation zones such as corridors, lobbies, or pedestrian pathways.*
- *Library and outdoor sitting space (shaded) can be considered under break-out spaces.*

Documentation Required

(i). Submit floor plans highlighting the locations of the breakout spaces provided.

(ii). Provide list of recreation spaces (such as breakout spaces or any indoor/outdoor games) provided in the project along with photographs.

(iii). Provide calculations indicating the number of building occupants catered through recreation spaces to the total number of building occupants, in percentage.

Exemplary Performance:

This credit is not eligible for exemplary performance under Innovation in Design & Operation.


Innovation
in Design & Operation

Innovation in Design & Operation

ID Credit 1.1 – 1.5 Points: 5

Intent

Provide design teams and projects the opportunity to be awarded points for exemplary performance above requirements set by the IGBC Green Factory rating system and/or innovative performance in Green Factory Building categories not specifically addressed by the IGBC Green Factory Building Rating System.

Compliance Options:

Some of the points that can be earned under this credit are as follows:

Credit 1.1: Innovation in Design & Operation

Identify the intent of the proposed innovation credit, the proposed requirement for compliance, and the proposed documentation to demonstrate compliance, and the design approach used to meet the required elements.

Credit 1.2: Innovation in Design & Operation Same as credit 1.1

Credit 1.3: Innovation in Design & Operation Same as credit 1.1

Credit 1.4: Innovation in Design & Operation Same as credit 1.1

Credit 1.5: Innovation in Design & Operation Same as credit 1.1

Note: Existing factory building is applicable for a maximum of 4 points and New factory building is applicable for a maximum of 5 points.

IGBC Accredited Professional

ID Credit 2 **Point: 1**

Intent

Support and encourage the involvement of IGBC Accredited Professional in the green factory building project, so as to integrate appropriate design measures and streamline certification process.

Compliance Options

At least one principal participant of the project team shall be an IGBC Accredited Professional.

Note: IGBC Accredited Professional (AP) shall be one of the participants from the project team.

Annexures

ARI

Air-conditioning and Refrigeration Institute

ASHRAE

The American Society of Heating, Refrigerating and Air-conditioning Engineers

BEE

Bureau of Energy Efficiency

CFM

Cubic Feet per Minute

COP

Coefficient of Performance

CRI

Carpet and Rug Institute

ECBC

Energy Conservation Building Code

EER

Energy Efficiency Ratio

FSC

Forest Stewardship Council

HDD

Heating Degree Days

HVAC

Heating Ventilation and Air-conditioning

IPLV

Integrated Part Load Value

LPD

Lighting Power Density

LPF

Liters per Flush

LPM

Liters per Minute

MSDS

Material Safety Data Sheet

NA

Not Applicable

NBC

National Building Code

PTHP

Packaged Terminal Heat Pumps

SHGC

Solar Heat Gain Coefficient

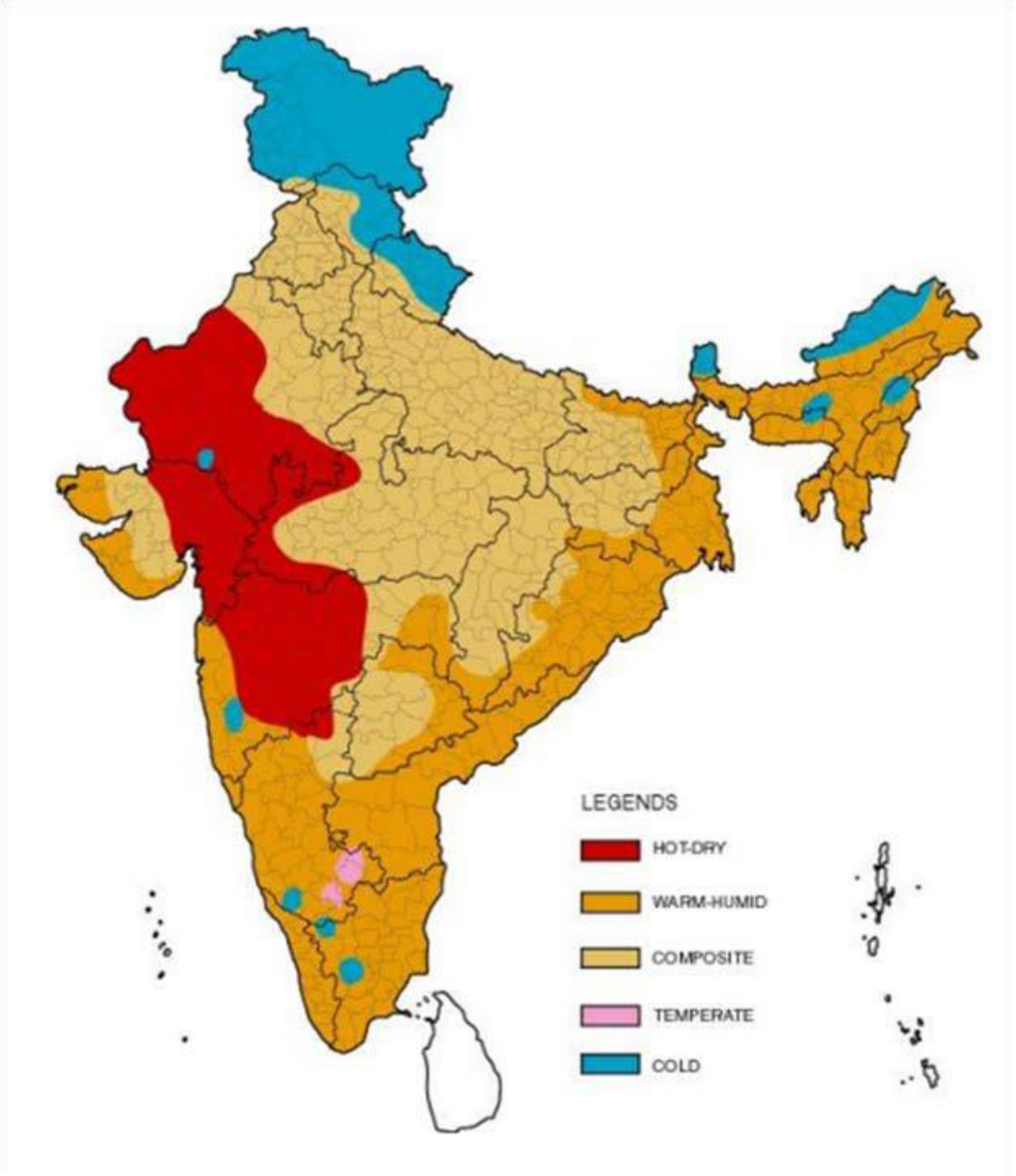
SRI

Solar Reflective Index

VOC

Volatile Organic Compound

Annexure I: Climatic Zone Map of India



Source: NBC 2016

Annexure – II: ISHRAE Standard 10001-2019

Indoor Air Quality

Table 1: Threshold values for indoor air quality parameters

Parameters		Units	Classification		
			Class A	Class B	Class C
Basic IAQ parameters	CO_2	ppm	Ambient + 350	Ambient + 500	Ambient + 700
	PM 2.5	µg/m³	< 15	< 25	< 25
	CO	ppm	< 2	< 9	< 9
	TVOC (equivalent to isobutylene)	µg/m³	< 200	< 400	< 500
Complementary IAQ parameters	PM 10	µg/m³	< 50	< 100	< 100
	CH_2O	µg/m³	< 30	< 100	-
	SO_2	µg/m³	< 40	< 80	-
	NO_2	µg/m³	< 40	< 80	-
	O_3	µg/m³	< 50	< 100	-
	Total Microbial Count	CFU/m³	Indoor = ambient	Indoor = ambient	-
Occupant Satisfaction		%	90	80	-

Note: In case the values of TVOC are higher than the specified threshold value as given in Table 1, individual VOCs shall be analyzed. At least the following VOCs that are toxic and common in indoor environments, need to be analyzed.

Table 2: Threshold value for various VOCs in IAQ

Parameter	Unit	Threshold value
Formaldehyde (HCHO)	µg/m³	30
Toluene	µg/m³	300
Benzene	µg/m³	3
Acetaldehyde	µg/m³	140
Epichlorohydrin (106-89-8)	µg/m³	3
Naphthalene (91-20-3)	µg/m³	9

Table 3: IAQ Parameter Test method and measurement equipment – for Path A measurement

IAQ element	Test method
CO_2	ISO 16000-26 Sampling strategy for Carbon dioxide (CO); 2 Note: Except for the screening measurement using sampling tubes, the CO2 concentration is recorded continuously using an automatic instrument
CO	Annex C of ISO 16000-26 Sampling strategy for Carbon dioxide (CO); 2 Note: Except for the screening measurement using sampling tubes, the CO2 concentration is recorded continuously using an automatic instrument.
NO_2	ISO 16000-15 Sampling strategy for Nitorgen dioxide (NO);
Formaldehyde	ISO 16000-3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – Active sampling method or ISO 16000 – 4: Determination of formaldehyde – Diffusive sampling method
VOCs	ISO 16000 – 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID
O_3	ISO 13964 : Determination of Ozone in ambient air – Ultraviolate photometric method
PM 10 and PM 2.5	ISO 16000-34: Strategies for the measurement of airborne particles

Table 4: Instrumentation requirement – for Path B measurement

Parameter	Sensor Quality Specifications for Path B
CO_2	Data Output Interval - 10 Minutes for each reading max Operating Temp Range: 0-40 degrees C Operating Range of RH - 10-85% (non-condensing) Measurement Range : 400ppm - 5000ppm Resolution : 5 ppm maximum Accuracy: 400 - 2000ppm : ±5% 2000 - 5000ppm : ±5% Lower Detection Limit - 400ppm Recalibration capability – Required
CO	Data Output Interval - 1 Minutes for each reading max Operating Temp Range: 0-40 degrees C Operating Range of RH : 10-85% (non-condensing) Measurement Range from : 0ppm till 1,500ppm Resolution: 1 ppm maximum Accuracy: 2% of reading Lower Detection Limit - 0ppm Recalibration capability – Required
PM2.5	Data Output Interval - 10 Minutes for each reading max Operating Temp Range: 0-40 degrees C Operating Range of RH - 10-85% (non-condensing) Measurement Range: 0 ug/m3 to 500 ug/m3 Resolution: 1 ug/m3 Accuracy: 0 - 150 ug/m3 : ±5ug/m3 150 - 500 : ±5ug/ m3 Lower Detection Limit - 0 ug/m3 Recalibration capability – Required
TVOC	Data Output Interval - 10 Minutes for each reading max Operating Temp Range: 0-40 degrees C Operating Range of RH - 10-85% (non condensing) Installation - should have the ability to install permanently. Measurement Range: 150 ug/m3 to 2000 ug/m3. Resolution of 10 ug/m3 Accuracy: 150 - 600 ug/m3 : ±20ug/m3 600 - 2000 : ±20ug/m3 Lower Detection Limit - 150 ug/m3 Recalibration capability – Required

Source: Indoor Environment Quality ISHRAE Standards 10001- 2019, Sec 6.3.2 an

About CII

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society through advisory and consultative processes.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. With its extensive network across the country and the world, CII serves as a reference point for Indian industry and the international business community.

In the journey of India's economic resurgence, CII facilitates the multifaceted contributions of the Indian Industry, charting a path towards a prosperous and sustainable future. With this backdrop, CII has identified "Globally Competitive India: Partnerships for Sustainable and Inclusive Growth" as its Theme for 2024-25, prioritizing 5 key pillars. During this year, it would align its policy recommendations, initiatives, and activities with this overarching framework to facilitate strategic actions for driving India's global competitiveness and growth through a robust and resilient Indian Industry.

About IGBC

The Indian Green Building Council (IGBC) was established by the Confederation of Indian Industry (CII) in 2001 to actively promote the Green Building concept in India. The Council is represented by all stakeholders of the construction industry comprising corporate, government, and nodal agencies, architects, product manufacturers, institutions, and more. The Council also closely works with governments, the World Green Building Council, and bilateral and multilateral agencies in promoting green building concepts in India.

With a registered green building footprint of 11.67 billion sq. ft, and with over 13,380+ projects adopting IGBC's 32 rating systems, the Green Building movement in India has been advancing at a rapid pace and transforming India, into one of the global leaders in green built environment. IGBC is a market leader with 90% of the India's green building projects adopting IGBC Green and Net Zero Rating Systems.

This reference guide has been printed on environmentally friendly, chlorine-free paper sourced from a responsibly managed forest.

For more information on Green Buildings, please contact

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