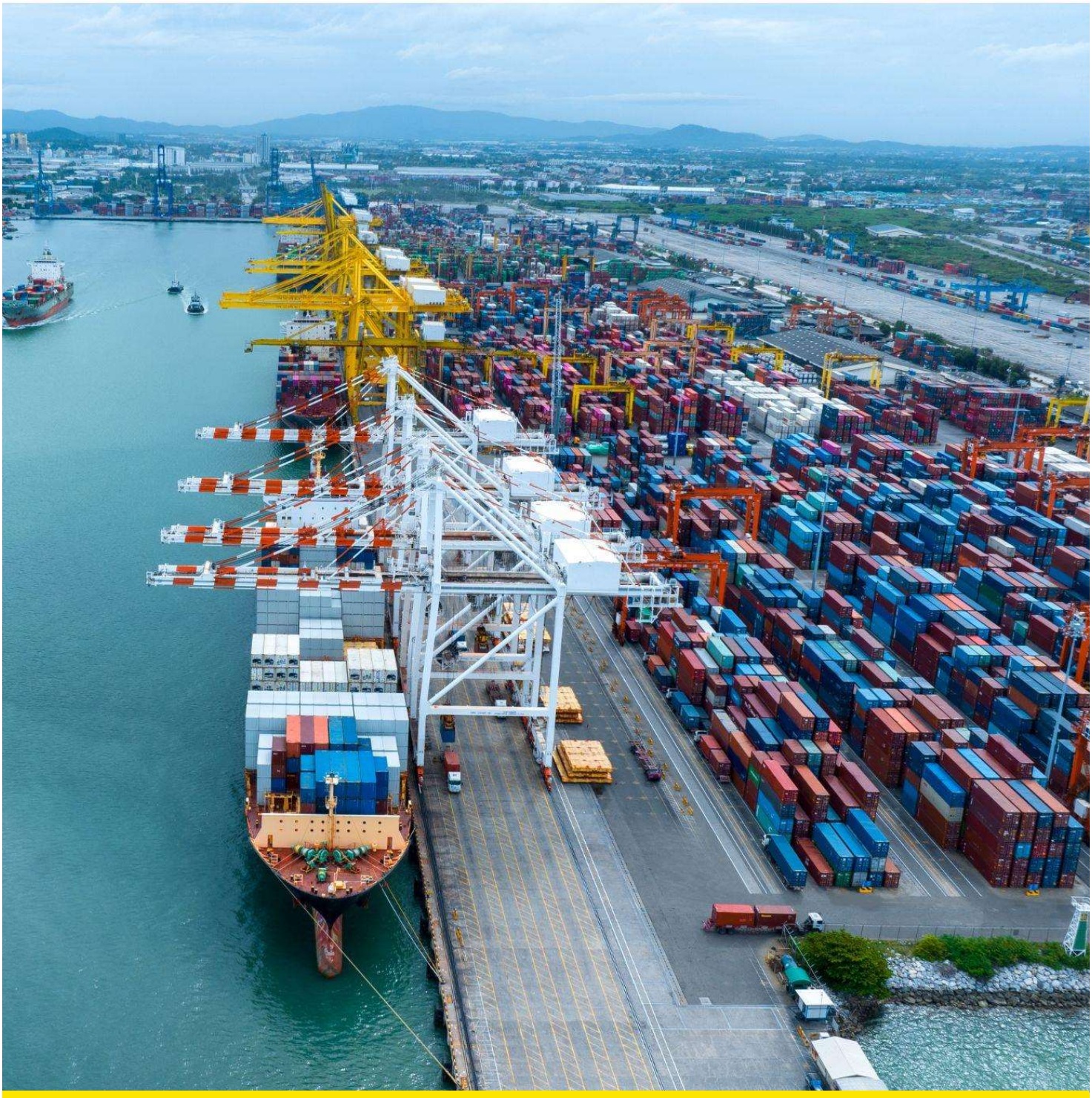
GRIHA RATING FOR PORTS

Version 1

ABRIDGED MANUAL



A GRIHA Council PUBLICATION

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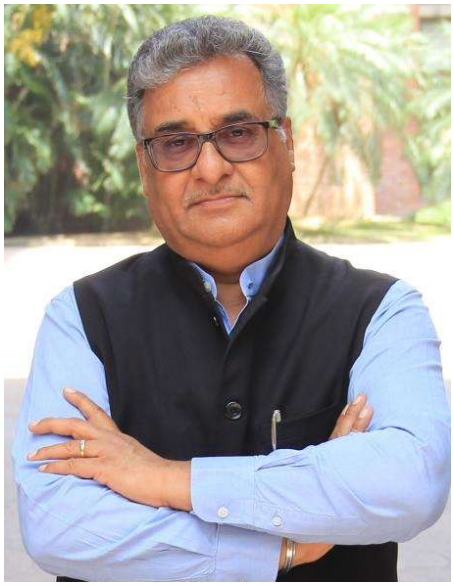
First Edition, December 2024

Foreword

VICE PRESIDENT



It is my immense pleasure to introduce the first-ever Green Rating for Ports in India, a landmark initiative that aligns the growth of our maritime sector with the principles of sustainability. With a coastline spanning over 7,500 kilometres and home to 13 major and over 200 minor ports, India's ports are pivotal to our nation's trade, commerce, and regional development. However, these vital gateways face pressing sustainability challenges, including high carbon emissions, waste management inefficiencies, water pollution, and threats to marine biodiversity.

The Green Rating for Ports of India has been designed to address these issues by providing a robust framework for environmentally responsible practices, operational efficiency, and policy-driven decision-making.

This initiative not only sets benchmarks for resource optimization and renewable energy adoption but also ensures that port development is in harmony with ecological preservation. Together, let us transform India's ports into global exemplars of sustainable growth, contributing to a greener and more resilient future for our nation.

Mr. Sanjay Seth
Vice President & CEO
GRIHA Council

Technical Advisors

Mr. Sanjay Seth, CEO & Vice President

Ms. Shabnam Bassi, Dy. CEO & Secretary

Mr. Akash Deep, Deputy General Manager & Treasurer

Development Team

Mr. Ankit Bhalla, Manager

Ms. Shaily Mahera, Manager

Ms. Jay Prabha Rani, Project Officer

Table of Contents

Abbreviations

Air Conditioner	AC
Air Handling Unit	AHU
American Society of Heating, Refrigerating and Air-Conditioning Engineers	ASHRAE
Autoclaved Aerated Concrete	AAC
British thermal unit	BTU
Bureau of Energy Efficiency	BEE
Bureau of Indian Standards	BIS
Central Pollution Control Board	CPCB
Certified Professional	CP
Chlorofluorocarbons	CFC
Climate Action Reserve	CAR
Coastal Regulation Zone	CRZ
Compact Discs	CD
Constrcution and Demolition	C&D
Conference of the Parties	COP
Daylight Factor	DF
Decarbonization Habitat Programme	DHP
Decibel	dBA
Diesel Generator	DG
Electronic Billing systems	EBS
Energy Conservation Building Code	ECBC
Energy Efficiency Measure	EEM
Energy Performance Index	EPI
Environmental Product Declaration	EPD
Geographic Information System	GIS
Heating, ventilation, and air conditioning	HVAC
Hydrochlorofluorocarbon	HCFC
Hydrofluorocarbon	HFC
Indian Council of Agricultural Research	ICAR

Abbreviations

Indian Society of Heating, Refrigerating and Air Conditioning Engineers	ISHRAE
light emitting diode	LED
Lighting Power Density	LPD
Maritime India Vision	MIV
Ministry of New and Renewable Energy	MNRE
National Ambient Air Quality Standards	NAAQS
National Building Code	NBC
National Coastal Zone Management Authority	NCZMA
National Logistics Portal	NLP
Operation and Maintenance	O&M
Ordinary Portland Cement	OPC
Port Management system	PMS
Radio Frequency Identification	RFID
Reinforced Cement Concrete	RCC
Renewable Energy	RE
Save Our Souls	SOS
Skylight Roof Ratio	SRR
Solar Heat Gain Coefficient	SHGC
State Coastal Zone Management Authorities	SCZMA
Sustainable Developmental Goals	SDG
Terminal Operating Systems	TOS
The Energy and Resources Institute	TERI
Tubular Fluorescent Lamps	TFL
Uninterruptible Power Supply	UPS
United Nations Framework Convention on Climate Change	UNFCCC
Urban and Regional Development Plans Formulation and Implementation	URDPFI
Urban Heat Island effect	UHIE
Useful Daylight Illuminance	UDI
Verified Carbon Standard	VCS
Volatile Organic Compound	VOC

About GRIHA

The National Green Building Rating System

With the rise in green building trends, it was vital to understand the right approach towards constructing such structures that would minimize the detrimental impacts of construction on the planet, while creating a healthy and comfortable living/working environment with zero or minimal incremental cost.

India is a land with varied climate typologies, categorized under five predominant zones as per the Energy Conservation Building Code (ECBC) 2017: hot-dry, warm-humid, composite, temperate, and cold. Therefore, the indoor thermal comfort conditions required in different parts of the country vary, and so does the energy demand of buildings in different regions. An indigenous rating system tailored to meet the requirements of each climate zone was needed which could provide definitive sustainable solutions to the rising energy stress and diminishing natural resources.

With the vision to promote sustainable architecture, The Energy and Resources Institute (TERI) developed the TERI-GRIHA (Green Rating for Integrated Habitat Assessment) green building rating system in 2005 that could benefit the community at large by reducing the GHG emissions from the building sector. After a thorough study of the internationally accepted green building rating systems and prevailing building practices in India, the rating system was developed as a tool to strike a balance between the established field practices and emerging technological concepts. The resultant-built form aims at creating an environmentally responsible structure that also provides healthy indoor environment for the occupants.

In 2007, the Ministry of New and Renewable Energy (MNRE) endorsed GRIHA as the National Rating System of India. This move focused on encouraging the construction of 'green habitats and energy-efficient solar buildings' in the country that suit the tropical climatic conditions.

Background

Indian ports play very significant role in formulating National strategies to reduce carbon emissions. Therefore, ports need to implement green initiatives that align with the nation's overarching vision and support the efforts to achieve India's long-term objective of achieving **Net-zero emissions by 2070.** The government of India has taken various initiatives at state and central both levels to decarbonize Ports.

Maritime India Vision (MIV) 2030, the roadmap prepared by the Ministry of Ports, Shipping and Waterways for the maritime sector in the country, aims to strengthen the maritime sector. Additionally, India's government under the **Sagarmala Program** has implemented several strategies aligned with these SDGs, such as promoting renewable energy adoption at ports, waste management systems, and sustainable development initiatives like green hydrogen and ammonia bunkering facilities, etc.

This will also help in contributing towards moving closer to the **UN Sustainable Developmental Goals (SDG)** which includes obligations on developing resilient infrastructure for safe, efficient and sustainable ports.

Key SDGs aligned with India's maritime ecosystem includes:

- **SDG 13 (Climate Action):** Initiatives to mitigate climate change impacts, such as transitioning to renewable energy at ports, enhancing energy efficiency, and supporting green shipping practices.
- **SDG 14 (Life Below Water):** Preservation of marine biodiversity by reducing pollution and promoting sustainable fishing practices, alongside combating the adverse effects of port activities on ecosystems.
- **SDG 9 (Industry, Innovation, and Infrastructure):** Encouraging modern, efficient port infrastructure and technologies to enhance logistics and reduce environmental footprints.
- **SDG 7 (Affordable and Clean Energy):** The adoption of solar, wind, and other renewable energy solutions at ports and shipping facilities to reduce dependency on fossil fuels.

Introduction

ABOUT THE RATING

The nation is geared up to achieve the Net Zero emissions target by 2070 as per the announcement made by the Honourable Prime Minister of India at COP26. As we proudly aim high, it is important for all sectors to come together and contribute towards the achievement of the national goal. With this intent, GRIHA Council has formulated guidelines for Green Ports in India while recognizing the pivotal role of Indian maritime sector in laying the foundation of net zero economy. To ensure the development of sustainable and resilient ports, the evaluation parameters and process in GRIHA rating varies for new and existing projects.

New Ports

The evaluation parameters for New Construction includes:

- Maintenance of existing site features that should minimize the negative impact of construction on critical zone of development.
- Inclusion of passive design measures to minimize energy consumption while maximizing thermal and visual comfort for occupants
- Clean energy transition.
- Potable water optimization
- Wastewater management
- Solid and liquid waste management

Existing Ports (with Retrofit)

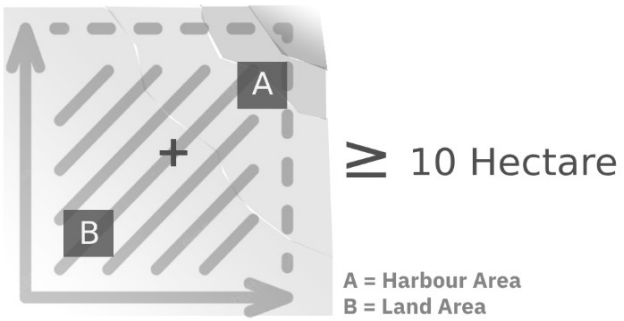
The evaluation parameters for Existing Port includes:

- Assessment and enhancement of the natural site features
- Implementation of operation and maintenance protocols (which includes green procurement, Metering and monitoring)
- Optimization of energy and potable water usage
- Clean energy transition
- Solid waste and wastewater management,
- Ensuring human comfort (including universal accessibility)

Introduction

ELIGIBLITY

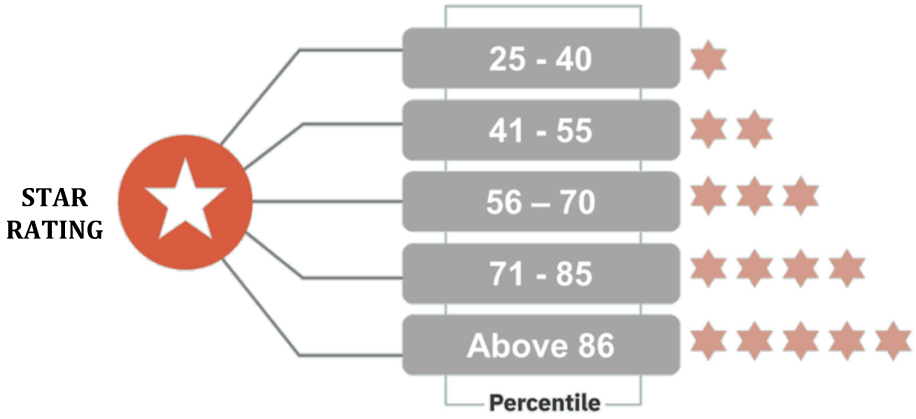
All New or Existing ports under expansion with site area more than 10 hectare (Land area + Harbour area) are eligible for GRIHA rating for Ports.



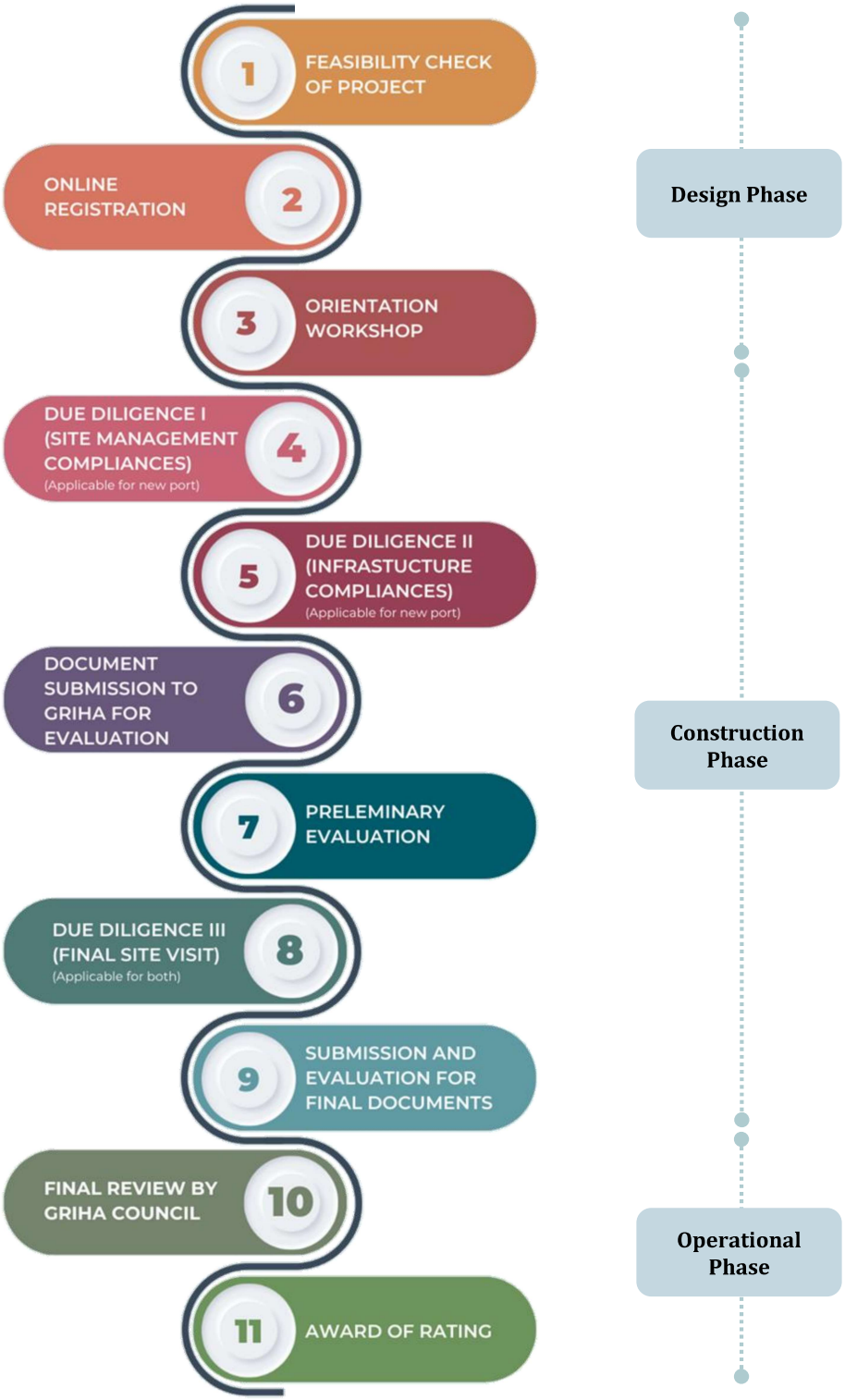
Scores and Rating

GRIHA rating for ports is a 100-point percentile-based system. On submission of the required documents and upon final assessment and evaluation, the project is awarded points for all the applicable appraisals. Total applicable points become the denominator while points which are not applicable (as confirmed through documentation assessment) to the project are deducted from both denominator and numerator. Points awarded represent the numerator.

The Points awarded under the innovation section are added only in the numerator which make them the bonus points.



Rating Process



Rating Structure

The GRIHA Rating for Ports is divided into 12 Criterions, which comprises of multiple appraisals, covering all pre-requisite and requisite parameters required to be addressed while making a **'Green Port'.** The last criterion 'Innovation' is a part of the rating system that rewards the project team for walking an extra mile to achieve environmental and social sustainability.

Criterion Number	Section	New Port Points	Existing Port Points
1	**Sustainable Site Planning**	11	11
2	**Project Management**	2	0
3	**Social and Environmental Aspects**	5	5
4	**Sustainable Materials**	9	11
5	**Climate Action**	11	11
6	**Energy Management**	15	12
7	**Occupant Comfort**	13	16
8	**Water Management**	13	13
9	**Waste Management**	5	5
10	**Carbon Assessment**	9	9
11	**Operation and Maintenance**	7	7
	Total	**100**	**100**
12	**Innovation (Bonus Point)**	5	5