



Unlock Your  
**Sustainability**  
Superpowers!

A Developer's Practical Guidebook for Sustainable Building Design



# About **CREDAI**

The Confederation of Real Estate Developers' Associations of India (CREDAI), established in 1999, serves as the apex body for private real estate developers in India. Our mission is to transform the Indian real estate landscape and advocate for Housing and Habitat. Representing over 13,000 developers across 230 city chapters in 21 states, CREDAI plays a critical role in shaping policy by regularly presenting our members' perspectives to various Ministries.

## Forewords



CREDAI is deeply committed to sustainability, aligning with India's ambitious vision of achieving Net Zero by 2070. As we navigate this transformative journey, we recognize that sustainable practices must be at the heart of our projects. This white paper, spearheaded by the CREDAI Women's Wing, delves into innovative solutions in energy, building materials, and water management, reflecting our dedication to green construction and responsible development.

Our vision is clear—CREDAI is focused on fostering a future that embraces Green Construction, Reforms, and Women Empowerment, while ensuring Transparency and Housing for All. By driving these initiatives, we are not only contributing to the development of a more sustainable real estate sector but also seizing the opportunity to build a New India. Together, we can take bold strides towards a greener, more inclusive future for our industry and our country.

**Boman Irani**  
President, CREDAI



CREDAI's women's group is focused on sustainability. They are working on a plan to help developers build homes that are better for the environment. This white paper, an initiative of the CREDAI Women's Wing (CWW), is a testament to this vision, offering an in-depth analysis of sustainable practices and innovative solutions for the real estate industry.

Beyond this white paper, CWW is actively organizing a series of conferences, webinars, and workshops, such as hosted World Green Building Week and a one-day sustainability workshop in collaboration with IIM Bengaluru. During this workshop, three dedicated teams focused on different aspects of sustainability, engaging in in-depth discussions and interactive Q&A sessions. The key insights from these discussions have been distilled into this white paper, covering three critical pillars of sustainability—energy, building materials, and water.

Through this white paper and our ongoing efforts, we hope to inspire real estate professionals to embrace sustainable development practices that not only enhance project outcomes but also benefit communities and the environment for generations to come.

**Rupa Shah**  
Convener, CREDAI Women's Wing





# Unlock Your **Sustainability** Superpowers!

A Developer's Practical Guidebook for Sustainable Building Design

Presented by



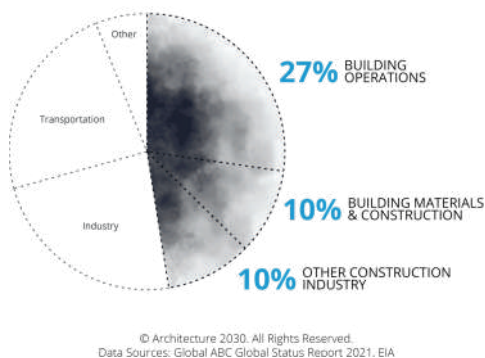
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## Unlocking

# Business Value With Sustainability

Sustainability has become the need of the hour, especially in the real estate sector, where the impact of climate change is increasingly evident. The built environment is responsible for approximately 40% of global carbon emissions, making it a critical player in the fight against climate change.



**Built Environment Contributes For More Than 40% Of Carbon Emissions Globally.**

As developers, the imperative to adapt to these changes is not just a moral obligation; it is a strategic business decision that can unlock significant value. By embracing sustainable practices, developers can not only mitigate their environmental impact but also enhance their business returns through improved asset values and increased investor interest. Developers who proactively adopt green building practices can position themselves favorably in a transforming market. Sustainable buildings not only reduce operational costs through energy efficiency but also attract a growing demographic of environmentally conscious tenants and investors who prioritize sustainability in their decision-making processes.

### About This Guide

This guide is based on extensive research and feedback from academia and industry. It offers sustainable design interventions that can be implemented with minimal capital expenditure (CAPEX) increases, helping builders achieve better financial and environmental outcomes.

### Base Case Project:

400 Unit Apartment Complex in Bengaluru, savings are measured also with the expectation that a builder shall maintain for 12 months before RWA begins to operate.

## The 8 Rupee Magic



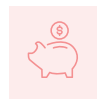
What can 8 rupees get you? Half cup of Chai and two biscuits?  
This is what happened when ₹8 was spent on our case project.



**3.5 lakh kWh**  
of energy savings



**7.8% reduction**  
in Operational CO<sub>2</sub>



**₹30 lakhs**  
in OPEX savings

Here are the low-cost 5 interventions that help the '8 Rupee Magic'.

### COOL ROOF - PAINT ★

Cool Roof coat with high SRI paints. Reduces heat gain and helps lower energy costs, creates comfort.

CAPEX	₹ 0.25/sq ft
OPEX Savings/Year	₹85000

### OPTIMIZED ENVELOPE - GLAZING

Comply window area with Eco Niwas Samhitha. Reduce heat gain and increase comfort.

CAPEX	₹ 7/sq ft
OPEX Savings/Year	₹849000

### OPTIMIZED ENVELOPE - PAINTS

High SRI paint on external walls, reduces heat gain and energy usage.

CAPEX	₹ 0.75/sq ft
OPEX Savings/Year	₹170000

### LOW-ENERGY STP ★

STP based on nature offer technologies that are more energy-efficient and environmentally friendly.

CAPEX	₹0/sq ft
OPEX Savings/Year	₹1446000

### ORGANIC WASTE COMPOSTING

Switching to Bio-Bins with grinder.

CAPEX	₹0/sq ft
OPEX Savings/Year	₹462000

★ Recommended interventions

The term 'CAPEX' implies the additional capex required over the normal cost incurred.

\*Government policy mandates.



## Materials

# Build For The Planet

Are you mindful in choosing better materials for your project?  
By making 5 low-cost decisions, you can create a sustainable impact.



**16500 Tons**  
of EC reduced



**43% reduction**  
in EC emissions



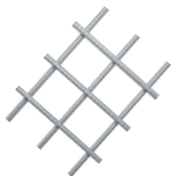
**₹15 lakhs**  
in OPEX savings



### OPTIMIZE CONCRETE MIX

Concrete mix optimized with 40% GGBS for all structural works.

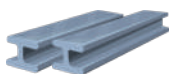
CAPEX	- ₹7/sqft
Embodied Carbon Impact	9.5 %



### OPTIMIZE STEEL DESIGN

Reduce steel quantity by adopting a design factor of under 4 kg/sqft.

CAPEX	- ₹32/sqft
Embodied Carbon Impact	3.1 %



### USE SECONDARY STEEL

Share of more than 50% scrap in steel making.

CAPEX	- ₹24/sqft
Embodied Carbon Impact	17 %



### LOW EC NON-STRUCTURAL CEMENT

Utilize low embodied carbon cement for all non-structural work.

CAPEX	- ₹2.5/sqft
Embodied Carbon Impact	14.73 %



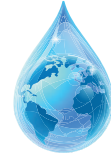
### ALTERNATIVE WALL BLOCKS

Use alternative wall blocks like AAC or Porotherm to reduce embodied carbon as well as heat gain to the building.

CAPEX	₹15/sqft
Embodied Carbon Impact	-1.20 %

# Water

## Being **Water Wise!**



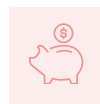
Water crisis resiliency is today's conversation. Tomorrows too!  
Do these 5 things and be one step ahead in water resiliency.



**71000 kL**  
of fresh water saved



**27000 Tankers**  
of avoided annually



**₹61 lakhs**  
in OPEX savings

These low-cost interventions help to save 1,66,00,000 liters of water!



### **LOW FLOW FIXTURES** ★

Reducing flow volume through aerators and flow regulators without affecting the experience.

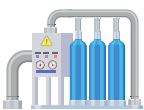
CAPEX	₹1.2/sqft
OPEX Savings/Year	₹ 5288000



### **CONSTRUCTION WITH RECYCLED WATER**

Replacement of traditional water sources with low impact reused water.

CAPEX	- ₹5.6/sqft
OPEX Savings	₹ 0*



### **STP FOR NON-POTABLE REUSE**

Implementing a Sewage Treatment Plant to reduce fresh water demand, regardless of regulatory mandates.

CAPEX	₹18/sqft
OPEX Savings/Year	0*



### **RAINWATER HARVESTING**

Maximizing rainwater harvesting and reuse for demand optimization.

CAPEX	₹2.4/sqft
OPEX Savings/Year	₹ 163000



### **SMART WATER METERING** ★

Reduce wastage, enable appropriate pricing and increase awareness by monitoring water usage.

CAPEX	₹3.9/sqft
OPEX Savings/Year	₹ 660000

# Sustainable Pioneers

Here are a few projects which took the right track towards sustainability to add business value and better value proposition for their end users through sustainable building design.



## CoEvolve Northern Star

### Interventions involved

- Solar PV for common areas
- Rainwater Harvesting
- Low Flow Fixtures
- STP for non-potable use

**Energy Savings**  
**300000 kWh**

**Water Savings**  
**27990 kL**

**Embodied Carbon**  
**5587 Tons**

Total Builtup Area  
**156195 sqft**

Annual Operational Savings  
**₹67 Lakhs**



## Rohan Upavan

### Interventions involved

- Smart Meters
- Energy Efficient Lighting
- Low Flow Fixtures
- Smart Water Meters
- Rainwater Harvesting

**Energy Savings**  
**1690000 kWh**

**Water Savings**  
**49114 kL**

Total Builtup Area  
**809607 sqft**

Annual Operational Savings  
**₹1.34 Crores**



## Assetz Canvas & Cove

### Interventions involved

- Smart Meters
- Energy Efficient Lighting
- Natural STP
- Smart Water Meters
- Rainwater Harvesting

**Energy Savings**  
**703000 kWh**

**Water Savings**  
**54750 kL**

**Embodied Carbon**  
**4930 Tons**

Total Built-up Area  
**947105 sqft**

Annual Operational Savings  
**₹94 Lakhs**



# A Pledge for Better Tomorrow



Name: Mr. Boman Irani  
Co. Name: Rustomjee Group  
City: Mumbai

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Rustomjee Group** commit to reducing the carbon footprint through design, innovative materials, eco-conscious construction methods and we aim to create vibrant and sustainable communities that prioritize energy efficiency for the well-being of our residents.

Rustomjee is in alignment with our government's goal to transition to a net-zero economy by 2050. Together, let us build a future where our projects enrich the lives of people while safeguarding our planet for generations to come.



Name: Getamber Anand  
Company Name: ATS Infrastructure Pvt. Ltd.  
City: Noida

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **(ATS Infrastructure Ltd.)** commit to develop "green rated" projects, which in turn improves the water & energy efficiency of projects. It also validates our compliance with existing and future environment necessities.

For our societies, it brings improved indoor environment along with enhanced health. It also ensures optimum utilization of resources and aides in reducing carbon footprint.



Gummi Ram Reddy  
**Ark Group**  
Telangana, Karnataka & Andhra Pradesh

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Ark Group** commit to

- Having all our projects Green Rated.
- 3 Million+ sq.ft under construction and proposed - all Green Rated.
- Take more green initiatives and embrace new carbon efficient technologies and alternatives.
- Work towards reducing and reusing construction waste.



Name: Gaurav Thakker  
Company Name: Thakkers Group Ltd  
City: Nashik

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Thakkers Group Ltd** commit to develop 100 acres of green villa project to support Credai's movement of Green Building.



Name: Bandish Ajmera  
Company: Ajmera Group  
City: Mumbai

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Ajmera Group** pledge to prioritize sustainability and conscious design in all our projects. We are unwavering in our commitment to minimize ecological footprint by using energy-efficient techniques, renewable materials & advanced green technologies.

Our goal is to achieve net zero waste and reduce our own baselines every year within our development footprint. We aspire to create spaces that harmonize with the natural world, elevating both the environment and the quality of life for future generations.



Name: Rupa Jaxay Shah  
Company Name: Savvy Infrastructure Pvt Ltd  
City: Ahmedabad

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Savvy Infrastructure Pvt Ltd** commit to develop approx 16lacs sqf. area by using Gas pressure welding technology to create development length of steel. This technique helps us to reduce steel wastage from 3% to 0.3 % on the overall requirement of steel at project.



Name: Mr. Deepak Goradia  
Co. Name: Dosti Realty Ltd.  
City: Mumbai

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Dosti Realty Ltd.** commit to work tirelessly towards achieving carbon-zero building developments. We are committed to integrating innovative, energy-efficient technologies, sustainable materials, and green building practices into my projects. Together, we can create a future where our buildings not only provide shelter but also contribute to a cleaner, more sustainable world for all.



Abhishek Bhatewara  
Rohan Builders  
Pune & Bangalore

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Rohan Builders** commit to Sustainable Development for the Planet & People:

**Pledges for PLANET:**

- Reduce Embodied CO<sub>2</sub> emissions by 4% & provide for Operational CO<sub>2</sub> emissions reduction by 12% (SCOPE 1 & 2 only) compared to base case established for Rohan Abhilasha2.
- Build infrastructure & awareness to help residents reduce external water use by 14%
- Targeted SDGs: 6, 7, 11, 12

**Pledges for PEOPLE:**

- Restore Dignity & Lifestyles of construction workers by holistic interventions in their housing, recreation, childcare & education.
- Targeted SDGs: 3, 4, 8, 10



Name: Dhaval Ajmera  
Company: Ajmera Realty & Infra India Ltd  
City: Mumbai

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Ajmera Realty** pledge to prioritize sustainability and conscious design in all our projects. We are unwavering in our commitment to minimizing our ecological footprint by using energy-efficient techniques, renewable materials and advanced green technologies.

Our goal is to achieve net zero waste and reduce our own baselines every year within our development footprint. We aspire to create spaces that harmonize with the natural world, elevating both the environment and the quality of life for future generations.



Name: Suhail Rahman  
Company Name: CoEvolve Estates  
City: Bengaluru

I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **CoEvolve Estates** commit to incorporating elements of sustainability in all our projects. At the construction level, we are minimizing water usage by using additives that aid self curing. At the consumer level, we have reduced dependence on freshwater by as much as 60% from NBC guidelines.



# A Pledge for Better Tomorrow



I am wholeheartedly dedicated to advancing the mission of sustainable real estate development. During this World Green Building Week, I pledge to lead the way in promoting ecofriendly construction techniques and utilizing technologies that enhance our environment.

At Rustomjee and Mt. K Kapital, we are fully committed to minimizing our carbon footprint through thoughtful design and the implementation of ecofriendly construction methods. Mt. K Kapital, our ESG impact fund, is where we have envisioned in taking up developments that create thriving and sustainable neighborhoods which work towards making livable spaces in the midst of green development aiming at improving the ecological balance and the lifestyle of our residents.

Let's work together to make a future where our efforts make people's lives better.

**Name:** Ms. Binitha Dalal  
**Company Name:** Rustomjee Group  
**City:** Mumbai, Maharashtra



I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Trine Holdings** commit to deliver only Sustainable real estate projects from today onwards. Our common areas have already been designed to reduce operational & embodied carbon as much as we can and thereby aiming to achieve net zero goals set for the organisation by 2045

**Name:** Sarah Jacob  
**Company Name:** Trine Holdings  
**City:** Kochi / Bengaluru  
**Date :** 11<sup>th</sup> September 2023



**I pledge to build sustainable buildings and work towards zero carbon emission mission.**

**We at, (Windsor Shelters) commit to protecting health and wellbeing of people in the construction industry**

**Name:** Sapna Rathi  
**Company Name:** Windsor Shelters  
**City:** Pune



I pledge to build sustainable buildings and work towards zero carbon emission.

We at, VGN commit to improve ground water level and promote sustainable ground water usage. We have adopted and implemented Urban Forestation across all our projects which has effectively increased the ground water level at our project sites. This is our lifelong commitment towards creating sustainable communities and green urban cities.

**Name:** Padma Devados  
**Company Name:** VGN Groups  
**City:** Chennai



I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Kimaya Group** commit to save water and electricity. And to start using local products and save on transportation.

**Name:** Dr. Deepali Gandhi  
**Company Name:** Kimaya Group  
**City:** Solapur , Maharashtra



I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **Sterling Developers** commit to building a culture of sustainable practices within the communities we develop by involving those that stay within or work within these communities.


**Name:** Anjana Sastri  
**Company Name:** Sterling Developers Pvt. Ltd.  
**City:** Bangalore, Karnataka



I pledge to build sustainable buildings and work towards zero carbon emission mission.

"We at, **Shroff Group** commit to create impact and reduce the carbon footprint of the buildings by adopting sustainable design principals and working consciously towards water, waste and energy consumption of the building".


**Pranati Shroff**  
**Shroff Group & Sustain and Save**  
**Pune**



I pledge to build sustainable buildings and work towards a zero-carbon emission mission.

We at, (**Shubham EPC Pvt. Ltd**) commit to Green and Sustainable Construction which includes reducing waste, electricity, and Water. Environmental Friendly Construction Solutions, Recycling waste, and Effective use of Natural resources.

**Name:** Archana Badera  
**Company Name:** Shubham EPC. Pvt. Ltd.  
**City:** Pune, Maharashtra



I pledge to build sustainable buildings and work towards zero carbon emission mission.

We at, **GreenJams** as manufacturers of Agrocete®, the world's first carbon-negative building material made from 100% upcycled materials, wholeheartedly commit to our mission of sustainability and environmental responsibility. Our commitment encompasses:

1. Advancing the adoption of green building materials in the industry.
2. Collaborating with construction professionals, architects, and developers to promote sustainable building practices.
3. Contributing to a more sustainable future by reducing waste and utilizing renewable resources in our manufacturing processes.
4. Continuously striving to reduce waste, conserve water, and protect natural habitats.
5. Promoting environmental awareness and sustainability within our organization and the community.

**Name:** Neeroja Jami  
**Company Name:** GreenJams  
**City:** Visakhapatnam



I pledge to build sustainable buildings and work towards zero carbon emission mission.

I pledge on behalf of **Group Orange** to actively promote and spread awareness about green building practices. We firmly believe that only through widespread awareness and a collective commitment we can achieve our goal of making sustainable building practices the norm.

**Name:** Amardeep Kaur  
**Company Name:** Group Orange  
**City:** Raipur, Chhattisgarh

# Mentored and Curated by

## Mentoring



**Anand Singhania**  
In charge VP



**Gaurav Thakker**  
Chairman



**Rupa Shah**  
Convener



**Sarah Jacob**  
Secretary



**Sapna Rathi**  
Secretary

## Youth Wing Leadership



**Nithish Reddy**  
Convener



**Binitha Dalal**  
Co-Convener



**Nilesch Vohra**  
Secretary

## CWW Sustainability Committee



**Pranati Shroff**  
Head

### Committee members

Petty Mathew  
Sangeeta  
Ruchi Mittal

Shilona Aggarwal  
Renu Chakola  
Pranali Kotkar

## Team Energy



**Suhail Rahman**  
Head

### Members

Thommen Ollapally  
Sreemathy Seetharaman  
Rahul Rajan  
Faizan M Siwani

## Team Materials



**Abhishek Bhatewara**  
Head

### Members

Akshay Mehta  
Nanditha Nagaraj  
Sarah Jacob  
Jaya Narula

## Team Water



**Pranati Shroff**  
Head

### Members

Sofia Firdous  
Rutuja Achalare  
Prof Vikram Kohli  
Mahesh Rathanshree

## Strategy Partner



**Prof Venkatesh Panchapagesan**  
Chairperson, Real Estate  
Research Initiative  
IIM Bangalore

## Technical Partner



**Sriram Kuchimanchi**  
Founder & CEO  
Smarter Dharma

# Strategy Partnership



The IIMB-Real Estate Research Initiative (IIMB-RERI) established in 2012, is an attempt to bring in the principles of academic research to the real-estate sector in India. IIMB-RERI is flag-bearer in this field, relying on well-established, data-driven analysis to study the Indian real estate sector with the highest standards of academic rigor.

# Technical Partnership



Smarter Dharma creates business value through the adoption of sustainability in the real estate industry. With over 17 million square feet of designed for space, Smarter Dharma has successfully designed solutions that mitigate more than 2.5 million tons of carbon emissions. Smarter Dharma is on **a mission to mitigate 1 billion tons of carbon by 2030** by enabling real estate sector with data driven design, and solutions for sustainable building design.

 [smarterdharma.com](https://smarterdharma.com)