

CII National Award for Environmental Best Practices 2025 Public

Since 1897, Godrej Enterprises Group (which includes Godrej & Boyce and its affiliates) has contributed significantly to India's economic growth and self-reliance by providing complex engineering, design-led innovation, and sustainable manufacturing solutions. From the world's first patented springless lock, and safes to pioneering Indian made typewriters and refrigerators, the conglomerate has also paved the way for the growth of key sectors like aerospace, energy, and security.



Company Name : GODREJ ENTERPRISE GROUP-CONSTRUCTION BUSINESS, VIKHROLI, MUMBAI

Project title: Resource material conservation through Vapor Curing System for Godrej Recycled Concrete Blocks and Pavers Plant. LCA study for Recycled Concrete block plant Reducing GWP from Concrete Blocks and project Execution of post LCA Study.

Trigger of the project



Automated Process of accelerated curing



No CO2 Emission during operation,
Material Cost Reduction
Improved delivery lead time.

Uniqueness of the project: Automated Operation, Lower Operating Costs, Controlled Environment: Enhanced Concrete Quality and Robust and Durable Equipment.

Major milestones: Achieved Highest production in last 10 Years , Savings In Material Cost by 8 % and Total 1058.9 MT material saved, saving Energy: <22011kWh>; Water Savings: <1488 kL>; Cost: <6.6 Lac> Overall Savings: <Rs 41.71 Lac>; Payback: < 15 months. initial mapping of project road map :Reduce cost by 3% in BOM

**1.1
Bn**

Godrej

5 Bn

Annual Revenue of Godrej Enterprises

54,000

Employees in the
Godrej family

01

1

CII National Award for Environmental Best Practices 2025 Public

LCA study for Recycled Concrete block plant Reducing GWP from Concrete Blocks and project Execution of post LCA Study.

TRIGGER POINT : Decreasing GWP from Concrete Blocks

Uniqueness of the project:

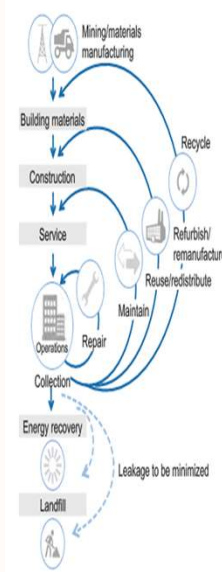
***Be the first to publish EPDs for RC blocks**

Goal

- Assess the environmental performance of Godrej's RC solid blocks and paver blocks
- Be the first to publish EPDs for RC blocks
- Identify the potential for decreasing Global Warming Potential (GWP):
 - Use C&D waste in production
 - Green energy – Carbonation of concrete
 - Increase fly ash content

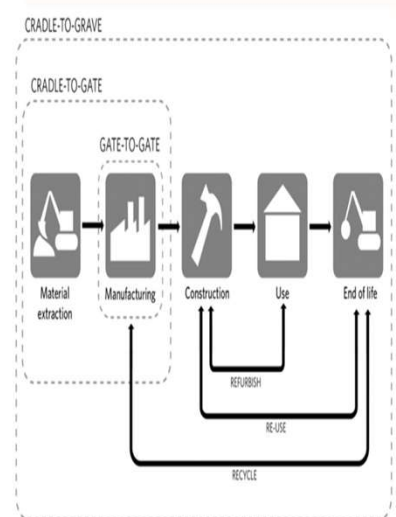
Godrej

Figure 14: Circular Economy Principles in the Construction Value Chain¹⁴



Source: Ellen MacArthur Foundation; World Economic Forum; The Boston Consulting Group

CIRCULAR ECONOMY PRINCIPLE: DESIGN PRINCIPLES TO BE CONSIDERED TO MAKE THE BUSINESS MODEL MORE SUSTAINABLE - LIFE CYCLE ASSESSMENT (LCA)



01

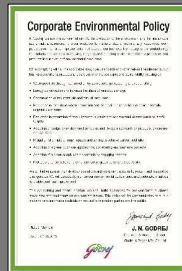
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Construction Business

We set up 1st 'Recycled Concrete Blocks' plant, that used Construction debris as raw material that replaces virgin material use extracted from quarries

Construction Materials: We manufacture and supply high-quality, sustainable construction materials so your projects can have a reduced carbon impact.

As pioneers of green buildings in India, we continue to lead the movement towards reducing carbon impact through design and material optimization.



Corporate Environmental Policy



Climate Group – EP100



CII Signed Net Zero Vision



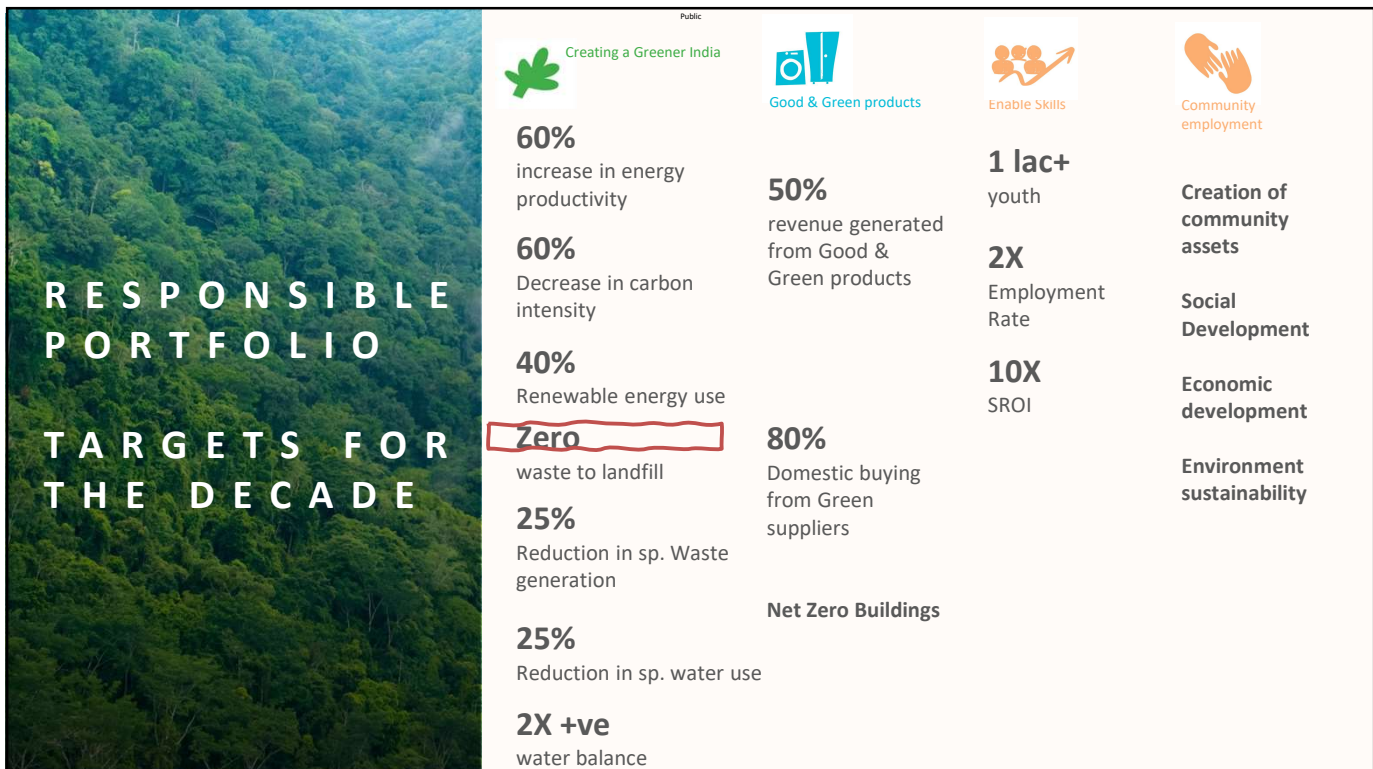
Signatory to India Plastic Pact



Godrej

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Slide-2: List all tangible & Intangible benefits



Tangible Benefits

- ❑ Increased Sales Revenue due to increased production capacity by 100 %.
- ❑ Reduced in Plant Transportation of Material.
- ❑ Reduction in raw material cost by 8 %
- ❑ Total 1058.9 MT material saved, saving Energy: <22011kWh>; Water Savings: <1488 kL>; Cost: <6.6 Lac>
- ❑ Overall Savings: <Rs 41.71 Lac>; Payback: < 15 months.
- ❑ Cumulatively 28000 MT of C&D waste recycled & 372 tCO₂e carbon sequestered per year
- ❑ 70% use of ecofriendly materials.
- ❑ 60% reduced water consumption.

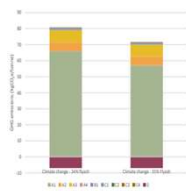
LCA Study



Sensitivity analysis

Increasing the flyash content to 35%:

- 11% reduction in total GWP
- 14% reduction in GWP from A1
- 2% reduction in GWP from A2



Godrej Technology for a better society



Intangible Benefits

- ❑ Customer delight through a reduction in Delivery lead time.
- ❑ Reduction in plant-level wastage (Reduced handling).
- ❑ Setting Standards for the industry.
- ❑ Optimized use of stockyard.
- ❑ CII GreenCo Star Performer Award in 2025
- ❑ Achieved Green Pro Certifications for all Recycled Concrete Products
- ❑ Occupant Comfort & Well-being Benefits
- ❑ Enhanced brand image

LCA Study

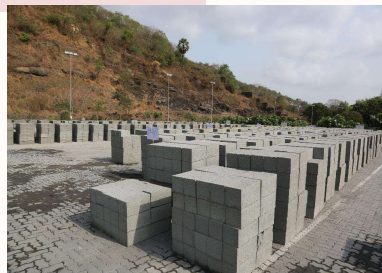
- ❑ To publish EPDs for RC blocks
- ❑ Improved brand reputation and customer satisfaction,
- ❑ Improved Employee Morale and Productivity
- ❑ Enhanced Decision-Making
- ❑ Regulatory Compliance and Policy Alignment.
- ❑ Greater Transparency and Trust

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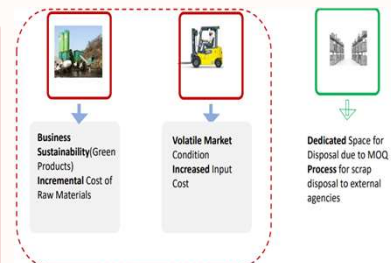
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Slide 4 :Replication potential and progress of project

Before:



After



Slide 5: Replication potential of project within sector

After



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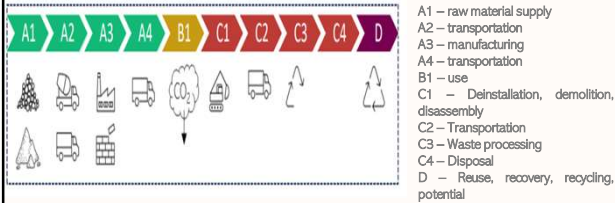
Slide 4 :Replication potential and progress of project

A method for calculating the environmental impacts from a product or service

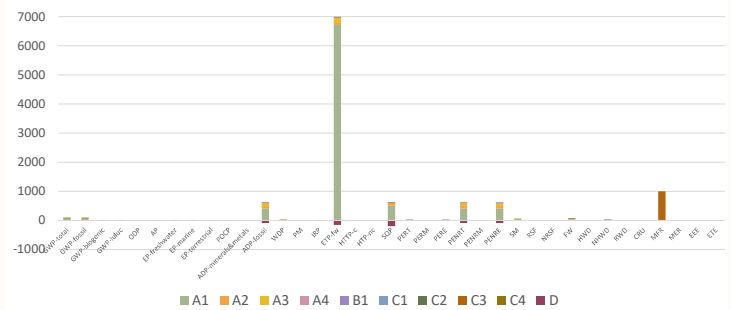
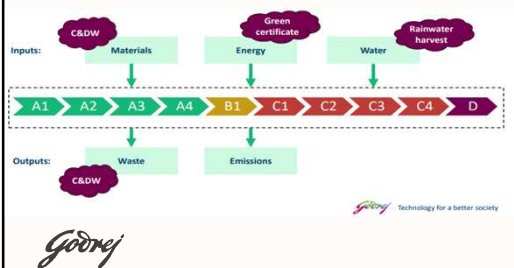
- ISO 14040/44: 2006 Environmental management – Life cycle assessment
- Principles and Framework/Requirements and Guidelines – EN 15804+A2: 2019 Sustainability of construction works
- Environmental product declarations - Core rules for the product category of construction products
- EN 16757: 2017 Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements

System boundary:

1 tonne of concrete block with a reference service lifetime of 100 years



Process model



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Slide 4 :Replication potential and progress of project

SINTEF Life cycle inventory

LCA

- Average RCB Solid Block and Paver Block

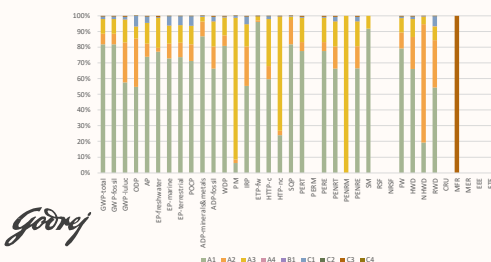


Product variations

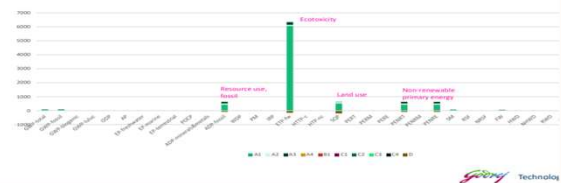
- Solid Block (390 x 90 x 190mm)
- Solid Block (390 x 100 x 190mm)
- Solid Block (390 x 125 x 190mm)
- Solid Block (390 x 140 x 190mm)
- Solid Block (390 x 150 x 190mm)
- Solid Block (390 x 190 x 190mm)
- Solid Block (390 x 140 x 230mm)
- Paver Block (Unipaver 100mm)
- Paver Block (Unipaver 80mm)
- Paver Block (Square 60mm)

Godrej Technology

Results – all environmental indicators

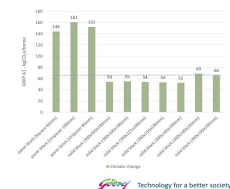


SINTEF Results – all environmental indicators



SINTEF A1 product variations

- Range: 52 – 161 kgCO₂e/t
- Average: 66 kgCO₂e/t



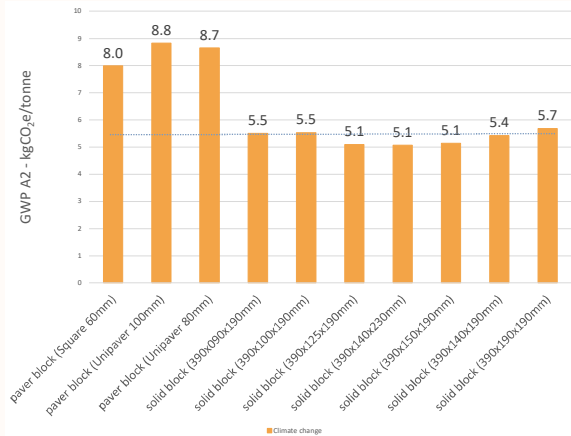
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Slide 4 :Replication potential and progress of project

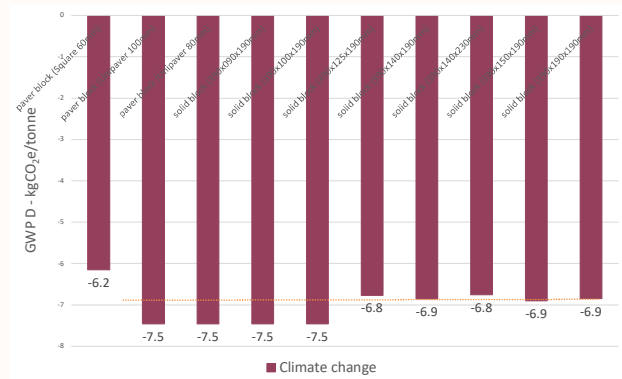
A2 product variations

Range: 5.1 – 8.8 kgCO₂e/t
Average: 5.5 kgCO₂e/t



D product variations

Savings from replacing materials with CDW
Range: -6.2 – -7.5 kgCO₂e/t
Average: -6.9 kgCO₂e/t



Godrej

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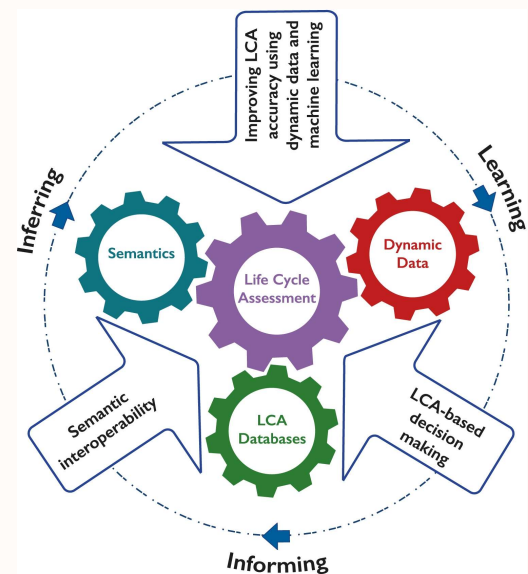
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Slide 6: List Challenges faced and brief on countering

Key Challenges in Vapor Curing System implementation

- Product cycle time.
- Consistent up-time of plant
- Interdependency of production processes
- Material Handling (Fork lift)
- Absence of adequate lead indicators for down time.
- Existing Curing time of produced material

Key Challenges in LCA study implementation



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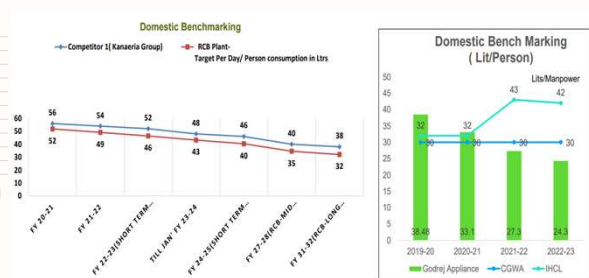
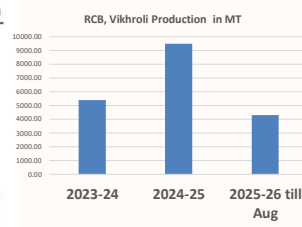
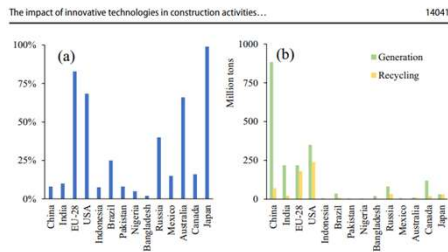
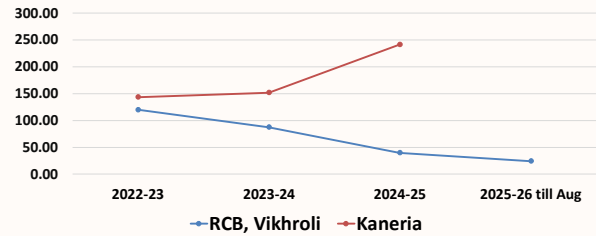
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Slide 7: Achieving national benchmarks/Standards

Energy Consumption External Benchmarking: Kaneria Vs RCB

FY	22-23	23-24	24-25
Kaneria Group (Kw/M3)	32.57	20.10	21.86
RCB, Vikhroli (Kw/M3)	12.82	13.41	10.46

GHG (Scope 1+2) Benchmarking



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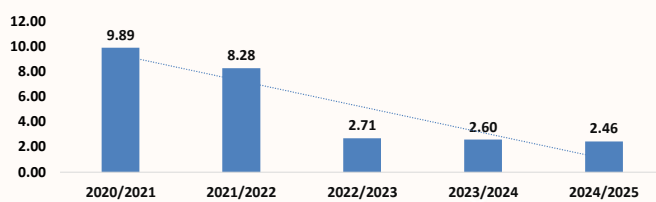
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Slide 7: Achieving national benchmarks/Standards

RCB_Scope 1+2 Specific GHG emission (kg CO₂e/m³ production)

2020/2021	2021/2022	2022/2023	2023/2024	2024/2025
9.89	8.28	2.71	2.60	2.46

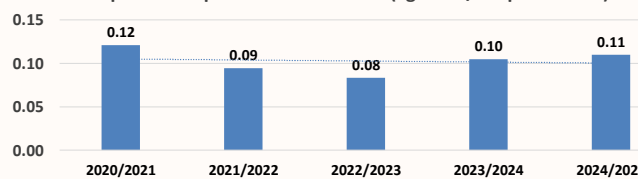
Scope 1+2 Specific GHG emission (kg CO₂e/m³ production)



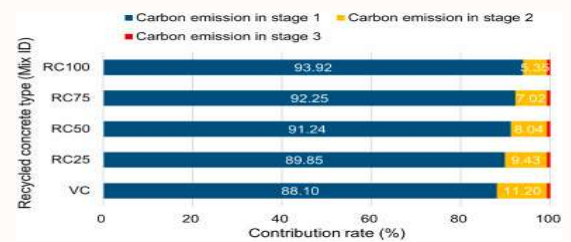
RCB_Scope 1+2+3 Specific GHG emission (kg CO₂e/m³ production)

2020/2021	2021/2022	2022/2023	2023/2024	2024/2025
0.12	0.09	0.08	0.10	0.11

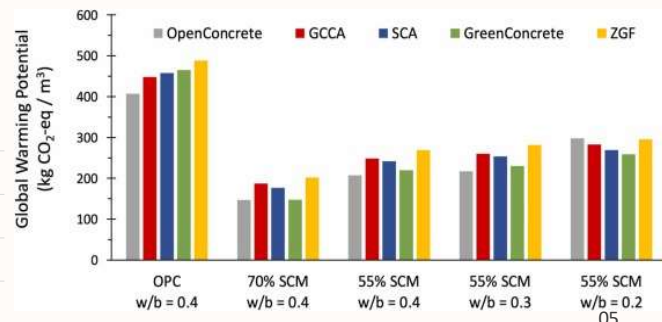
Scope 1+2+3 Specific GHG emission (kg CO₂e/m³ production)



.GHG emission of recycled concrete considering carbon uptake effect
(Source: <https://www.sciencedirect.com/science/article/pii/S2666165925000468>)



Global Warming Potential (GWP) of each concrete mixture evaluated using variety of environmental impact tools. The average values are reported



(source: <https://www.sciencedirect.com/science/article/pii/S2214509523010136>)

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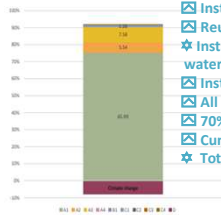
Slide 7: Achieving national benchmarks/Standards

Public



Global Warming Potential

- Majority of GHG emissions come from A1 – Raw material supply (ca. 90%).
- This is followed by A3 – Manufacturing (ca. 10%) and A2 – Transport (ca. 7.5%)
- Module D shows benefits of using recycled content (ca. 9%).



Technology for a better society

Key Achievements Before LCA Study

- 100% renewable energy electricity supply
- 39% recycled water usage in the plant
- Installed rainwater harvesting system on site
- Reutilization of waste from RMC sludge
- Installed vapor curing system for process efficiency and 60% reduced water consumption
- Installed root zone management system for sewage water treatment
- All RCB products are Green Pro certified
- 70% use of ecofriendly materials
- Cumulatively 25000 MT of C&D waste recycled
- Total 372 tCO₂e carbon sequestered per year

Key Achievements After LCA Study & Projects execution

Summary of the environmental benefits achieved (per year)

Electrical energy savings	22011	kWh
Thermal energy savings	27596.2	kL of fuel
	2000	m3 of fuel
GHG emission mitigation	20050	MT of CO ₂ eq.
Water conservation	1488	KL of water
Resource conservation	1058.9	MT of material
Renewable energy addition	281500	kWh of RE
Waste Reduction	1400	kgs of waste
Waste diverted from landfill	1000	kgs of waste
Total investment made	48203474	Rs Lakhs
Monetary savings	63266170	Rs Lakhs



Peer review of external LCA study



Verification of Life Cycle Analysis of Products

Ref Report # 2023-012871 Report dated 03 Dec 2023

Verified on 05 Jan 2024 (valid till 05 Jan 2027)

It is to caption that:-

Product Name: Solid Blocks and Paver Blocks

Intended use:

- Solid Blocks have minimal need of ongoing maintenance due to high strength and have good acoustic performance. With superior quality and enhanced durability, Goodrej solid blocks help in speedy construction with minimum wastage of material.
- Paver Blocks are aesthetically appealing with varied choice of shapes, surface finish and colors. Their shapes provide great interlocking, allowing the pavements to withstand harsh conditions and longer durability, thereby improving cost efficiency.



Dimensions W x H x D (mm): Solid Block – (300*300*100), (300*150*100), (300*125*100), (300*140*100), (300*150*150), (300*150*200), (300*140*200)

Paver Block – (Square 300), (Square 400), (Square 600)

Manufacturer / Assembled by: Goodrej & Rejco Manufacturing Co Ltd.,

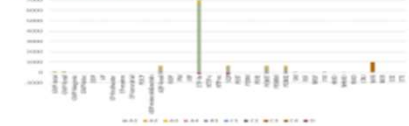
Address:

Pimpri-Chinchwad, Pimpri, Mumbai 400075, India

Material Classification: Solid Block – (300*300*100)

63% - Crushed sand, 22% - 10 mm aggregate, 2% - Fly ash, 5% - Cement, 7% - Water

Environmental Results:



The LCA have been carried out and verified in accordance with ISO 14040 and ISO 14044 using life cycle assessment software Simapro version 9.3.

This verification of the data submitted is valid till the provided period subject to manufacturing conditions in the factory production control itself are not modified significantly.

Verified by:

Kiran Gopale
Green Initiative Department – Goodrej Interio

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(source: <https://www.sciencedirect.com/science/article/pii/S2214509523010136>)

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SLIDE 8: Priority plans on fast track for +1 year and +2 year

Public

Data: BOM cost Variance 24-25 Q1

RCB MIX Before Vapour Curing Last Monsoon									
C. Sand	Recycle sand	10 MM	Cement	Fly ash	Water	Admixture			
KG	KG	KG	KG	KG	Lts	Lts			
1550	130	480	160	0	150	1			
0.965	0.4	0.865	5.4873	2.3499	0	62.5			
1495.75	52	415.2	877.968	0	0	62.5			
RCB MIX With Vapour Curing									
C. Sand	Recycle sand	10 MM	Cement	Fly ash	Water	Admixture			
KG	KG	KG	KG	KG	Lts	Lts			
1436	440	330	160	0	150	0.5			
0.965	0.4	0.9	5.5	2.3	0	62.5			
1385.74	176	297	880	0	0	31.25			
								Cost of Per M3 in RS/-	Percentage Saving
								2168.45	4.6
								Total Saving Per M3 RS/-	
								133	

Data: BOM cost Variance 25-26 Q1

RCB MIX Before Vapour Curing									
C. Sand	Recycle sand	10 MM	Cement	Fly ash	Water	Admixture			
KG	KG	KG	KG	KG	Lts	Lts			
1550	130	480	160	0	40	0.8			
0.99	0.35	0.865	5.4873	2.3499	0.01	62.5			
1535	46	415	878	0	0	50			
RCB MIX With Vapour Curing									
C. Sand	Recycle sand	10 MM	Cement	Fly ash	Water	Admixture			
KG	KG	KG	KG	KG	Lts	Lts			
1410	450	320	160	0	150	0.5			
0.99	0.4	0.9	5.7	2.3	0.0	62.5			
1358	158	277	912	0	2	31			
								Cost of Per M3 in RS/-	Percentage Saving
								2224	5.1
								Total Saving Per M3 RS/-	
								149	



- Focus on RCA Percentage increase in the mix. Take new trails for less cement contain. Identify the new RM vendor to Reduce cost. Optimization of VCS to get the better throughput which will help to reduce the cement contain. PPC Cement trials has been done waiting for rate approval from purchase Dept. we are expecting to reduce cost by 3% in BOM.

- Revenue has been achieved as per the plan.
- Delivery lead time reduction has been achieved as per the plan.
- Production variance against the plan which will be cover by this financial Year 25-26.
- BOM cost reduction will be achieved by Q2 of this financial year.

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Public

SLIDE 8: Top ten best practices which will form the core of approach for +1 and +2 year

- 1. 100% Renewable energy.
- 2. Use of recycled water 40%
- 3. RWH installation.
- 4. RMC Sludge utilization.
- 5. Installed Vapor curing System
- 6. Third Party Energy Audits.
- 7 Kaizen implementation.
- 8. Re-use of Plastic strips,
- 9. CNG vehicle for utility.
- 10. Ecofriendly Forklift 5th Generation introduced for internal transportation.
- VCS plan Vs achievement:

VCS Attribute	Plan	Actual Increase Q1 24-25	Actual Increase Q1 25-26
Revenue	24	(2.51 Cr.)8.2%	(4.52 Cr.)80%
Productivity increase	100%	4%	45%
Material cost reduction	8%	4.6 %	5.1 %
Delivery lead time reduction	50%	50%	50%

LCA best practices

Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

TUFFBLOCKS Solid Recycled Concrete

from
Godrej & Boyce Mfg. Co. Limited

Programme:
The International EPD System, www.epdindia.com
Programme operator:
EPD International AB
EPD registration number:
IS-P-000004
Publication date:
202X-XX-YY
Valid until:
202X-XX-YY

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication of www.epdindia.com

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Public

SLIDE 10: Major learnings from the project implementation

Innovation

Godrej Construction has pioneered the manufacturing of sustainable construction solutions in India by adopting circular principles. By recycling concrete waste from construction and demolition (C&D) waste, using aggregate and reduced effort consuming in waste and durability. The plant manufactures concrete blocks, pavers and other sustainable products for the industry. Godrej Construction's Pimpri-Chinchwad plant can recycle up to 500 Tons of concrete waste daily per day. Certificates 20200 MT of C&D waste recycled verified.

Material Resource Management

Projects undertaken are as follows:

- Recycled material/Forklift counterweight/manufacturing utilization of waste metal punching scrap for making counterweight for forklifts
- Box Culvert: Notable contributions include supplying over 400 box culverts, made with 10% recycled concrete aggregates, for significant infrastructure projects like the Coastal Road
- Cocon project: In a nod to sustainability, the office was constructed using a concrete mix design that incorporated up to 20% Recycled Concrete Aggregates (RCA), sourced from recycled concrete debris processed at the Godrej & Boyce Recycled Concrete manufacturing facility in Vikhroli, Mumbai
- 20% Recycled Concrete Aggregates (RCA) used for manufacturing products like PCP products like U Drain, Precast road, Slabs

Water Management

The following initiatives were taken for water conservation:

- Rainwater Harvesting at RCB plant
- Expansion of digitation in CIP system with monitoring and control
- Moisture sensor to control watering in the green belt area
- Biological system to stop flushing water in urinal
- Water sprinkler system for garden and dust control
- Jet cleaning machines for toilets
- Indirect water curing system for process efficiency and 60% reduced water consumption
- Riczone system to develop for effective Sewage water utilization
- Efficient utilization of domestic sewage water for landscape irrigation
- Rainwater for washing water utilization in process
- Installation of digital water flow meters at RCB plant
- Recycled water utilization increased in process

Product Stewardship

Product Stewardship & Life Cycle Assessment

- A method for calculating the environmental impacts from a product to service
- ISO 14040:2006 Environmental management - Life cycle assessment - Principles and Framework/ Requirements and Guidelines
- EN 15804:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15707:2017 Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements

Global Warming Potential

- Majority of GHG emissions come from A1 - Raw material supply (ca. 80%)
- This is followed by A2 - Manufacturing (ca. 10%) and A2 - Transport (ca. 7.5%)
- Module D shows benefits of using recycled content (ca. 2%)

Sensitivity analysis

- Increasing the flyash content to 35%
- 11% reduction in total GWP
- 14% reduction in GWP from A1
- 2% reduction in GWP from A2

Energy Management and Renewable Energy

Projects undertaken are as follows:

- Optimization of water pump for production: Water pump exhibited increased energy consumption while handling the requisite volume of water from the reservoir tank to the production tank. Existing 7.5 HP water pump replaced with 3 HP Energy efficient water pump
- Replacement of high voltage halogen bulbs with new LED's: 200 watt halogen bulbs were being used in the plant which were replaced with 120 watt and 80 watt LED's. This initiative reduced the power consumption and resulted in annual savings of 20000 kWh, 50% reduction
- Process optimization: Production process improvement to reduce wastage of Energy. Due to wet material, waiting time of bucket was more. Changed the production process, by reorganizing the Raw Material Sequence. This reduced the waiting time which has reduced the Energy consumption. Resulted in 5% reduction in kWh power consumption
- IoT Installation: Installation of IoT on critical utilities for energy monitoring

Awards and recognitions_ GreenCo Star Champion

Godrej Construction
11,767 Followers
1mo

Every recycled concrete block, every paver, every path we create is created to make the world a little greener.

With this mission in mind, our commitment to sustainable construction practices has been recognized with the GreenCo Star Performer 2025 Award at the 14th CII GreenCo Summit.

Let's build a safer, greener tomorrow together.

#Godrej #GodrejConstruction #Sustainability #SustainableDevelopment #FutureReady #GreenCoSummit2025 #EcoFriendly #Environment

Better for the planet, greener for you.

Our GreenCo Star Performer award recognises the difference we build.

Star Performer

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Public

SLIDE 10: Major learnings from the project implementation

- LCA helps us in institutionalizing environment friendly and sustainable processes and minimizing impact across the value chain
- Environmental product declarations (EPDs)
- Assess GWP savings from carbonation of concrete
- Identify other measures for reducing GWP
- Investigate other environmental indicators



Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

TUFFBLOCKS Solid Recycled Concrete

from
Godrej & Boyce Mfg. Co. Limited

Godrej | GODREJ & BOYCE

Programme:
The International EPD System, www.epdint.org
Programme operator:
EPD International AB
EPD registration number:
S-P-00000X
Publication date:
202X-XX-YY
Valid until:
202X-XX-YY

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication of epd-int.org/epd-int



Godrej

Joint presentation Product Stewardship & Life Cycle- Decreasing the Global Warming Potential for Concrete Blocks by C&D Presented at National Workshop on "Recent Development with recycling and use of C&D waste in construction sector" at Vigyan Bhawan in New Delhi. Organized by CPWD in collaboration with SINTEF Norway

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Public

Thank You

Godrej

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