TSF Brakes India



Net Zero Through Circular Foundry Practices: Sand Reclamation, Material Recovery & Waste Valorisation

CII National Award for Environmental Best Practices 2026

Brakes India (P) Ltd.
Foundry Division , Sholinghur,Tamilnadu-632001

Index

Sr. No.	Particulars	Slide No.
1.	Company Profile	3-4
2	Project Title	5
	Trigger Behind the Project	
	Uniqueness of the Project	
	Project Timeline	
6	Waste Generation Trend	6
7	Circular Economy Initiatives	7-17
8	Result	18
9	Tangible Benefits	19
10	Intangible Benefits	20
11	Replication Potential Across Sector	21
12	Challenges & Counter Measures	22
13	Future Plan	23
14	Major Learnings	24

Company Profile

TSF

100

Years of
Rich Legacy &
Leadership

Value & Service embedded in our Core

Trust as our foundation

In a Nutshell

- 19 Business Entities
- $4 Bn. Consolidated Turnover FY26
- 1,400+ Branches
- 45,000+ Global Talent Strength
- 50 Plants

TSF Group

- **Auto Components**: Brakes India; AXLES INDIA; TEL; LEGGARO; dunes; Sundaram Dynacast; WCWL; BIADS
- **Auto Distribution & Dealerships**: IMPAL; Madras Auto Service; Sundaram Motors
- **Trusts**: Laxmi Charities; Sundaram Medical Foundation
- **Finance & Insurance**: Sundaram Finance; Royal Sundaram General Insurance; Sundaram Home; Sundaram Alternates; Sundaram Mutual; Sundaram Business Services

Brakes India- Business Units

One stop shop for all braking solutions - Full Systems Delivery



Light Vehicle Brakes



Heavy Vehicle Brakes

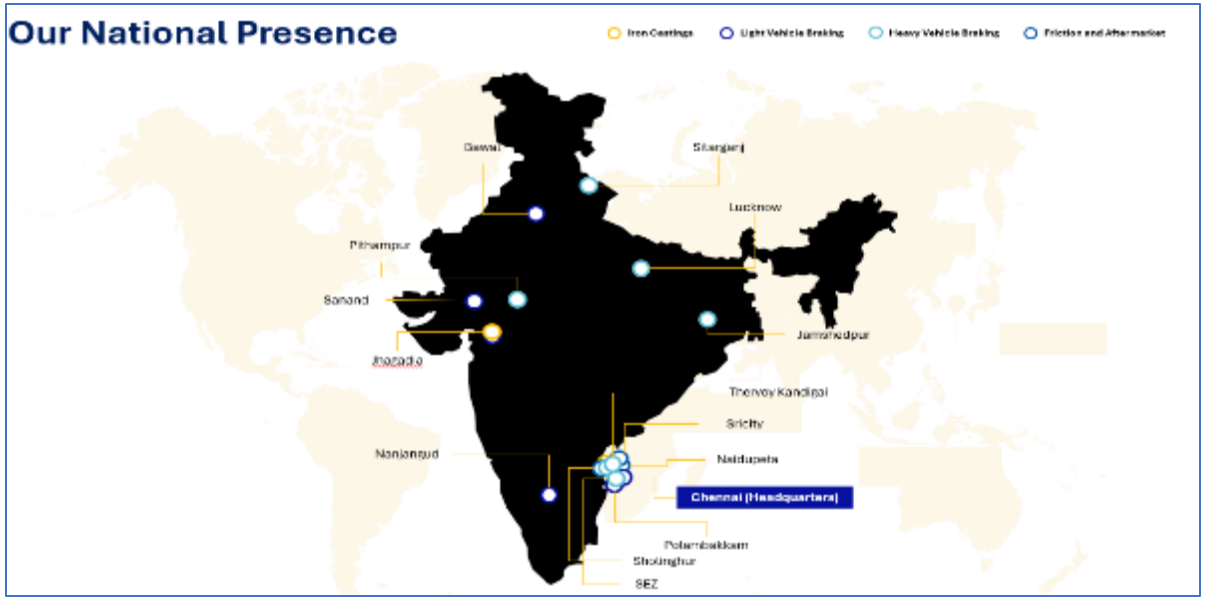


Iron Castings

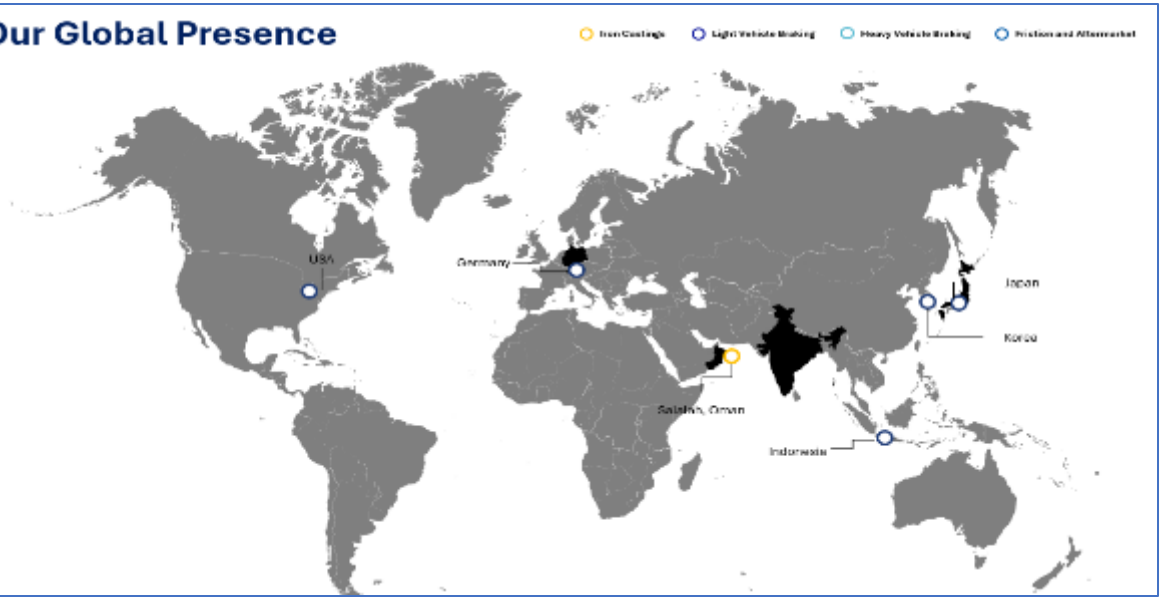


Friction & Aftermarket

Our National Presence



Our Global Presence



© Private and Confidential

Brakes India Foundry Division- Company Profile

Foundry Business At A Glance

1981 Established the first foundry in Sholinghur

INR ~ 24000 Mill
USD ~ 292 Mill (Sales Turnover 2024-25)

Capacity

Brakes India's foundry is the largest manufacturer and exporter of automotive castings in India with a capacity of 2,22,000 tons of iron castings annually. The focus is also on green manufacturing & recyclability.

Capability

- Lowest iterations in design
- All tools manufactured in-house
- Machined painted and sub-assembled parts
- Complex cored parts

~2,200+ employees

13 Foundry lines spread across 4 locations world wide (Sholinghur, Jhagadia, Naidupet and Salalah – Sultanate of Oman)

Exports Constitute 50% of the total sales. Countries include Germany, UK, Sweden, France, Belgium, Czech Republic, Romania, Austria, Thailand, Mexico, Brazil, Australia, Malaysia, Russia, South Africa, USA

What makes us one of the Top Foundries in the World



- Strategic investments in Technology and Process Innovation
- Global presence & local support
- Market-leader in precision & ability to produce complex parts that are high on machinability
- Product knowledge & speed of new product development
- Setting objectives to eliminate, control & minimize carbon footprint
- Increase total renewable energy share from 21% to 93% by 2025, through hybrid sources
- Pioneers of the world's first "Green Iron Castings Business"
- Commitment to sustainable resource use & protection of ecosystem

Our Global Footprint





Sholinghur | Since 1981 | Disamatic 3 | Capacity: 60,000 TPA



Pollivalam | Since 2005 | Disamatic 1 | Horizontal KW 1 | Capacity: 30,000 TPA



Jhagadia | Since 2012 | Disamatic 3 | Capacity: 60,000 TPA



Naidupeta | Since 2018 | Disamatic 1 | Horizontal KW 1 | Capacity: 36,000 TPA



Salalah (Oman) | Since 2008 | Disamatic line 2 | Capacity: 36,000 TPA

Exports Across The Globe



- **Project Title :** Net Zero Through Circular Foundry Practices: Sand Reclamation, Material Recovery & Waste Valorisation

➢ Trigger Behind the Project

Level: Senior Management & Sustainability Leadership

Drivers:

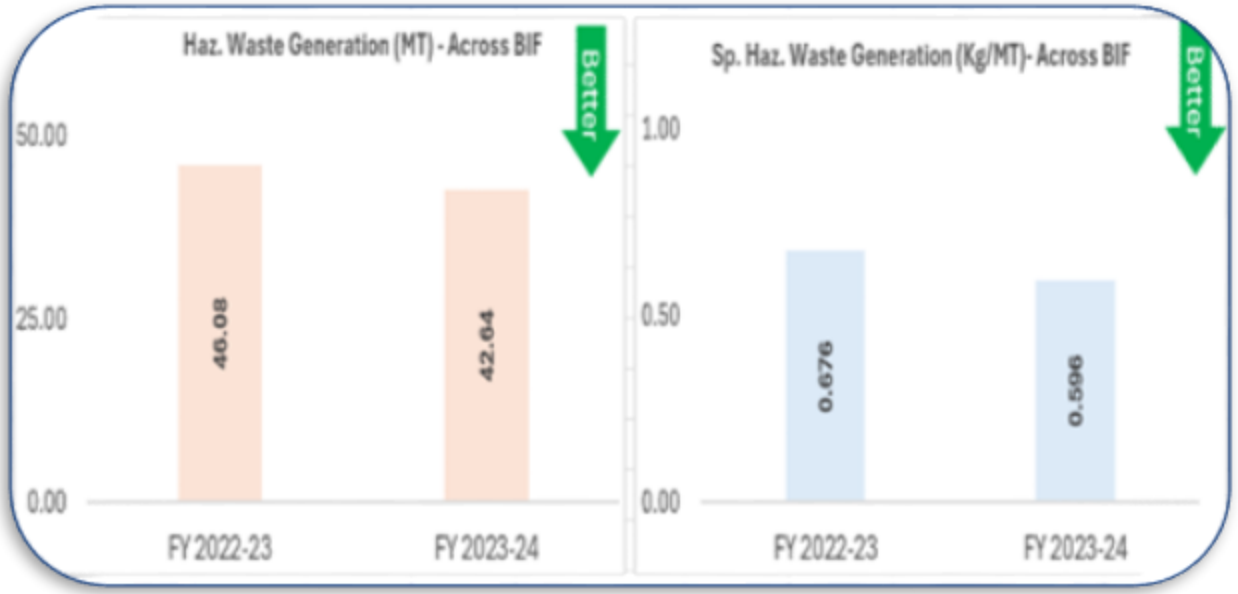
- Rising cost and scarcity of virgin raw materials.
- Increasing generation of spent foundry sand.
- Net Zero and ESG commitments.
- Need to reduce landfill dependency.
- Customer and stakeholder expectations for circular economy practices.

Project Timeline	
Milestone	**Timeline**
Baseline waste assessment	FY 2022-23
Sand reclamation optimization	FY 2023-24
Waste sand utilization partnership	FY 2024-25
Circular economy implementation	FY 2025-26
Full-scale operation & monitoring	FY 2026-27 onwards

➢ Uniqueness of the Project – Innovative Waste-to-Resource Approach

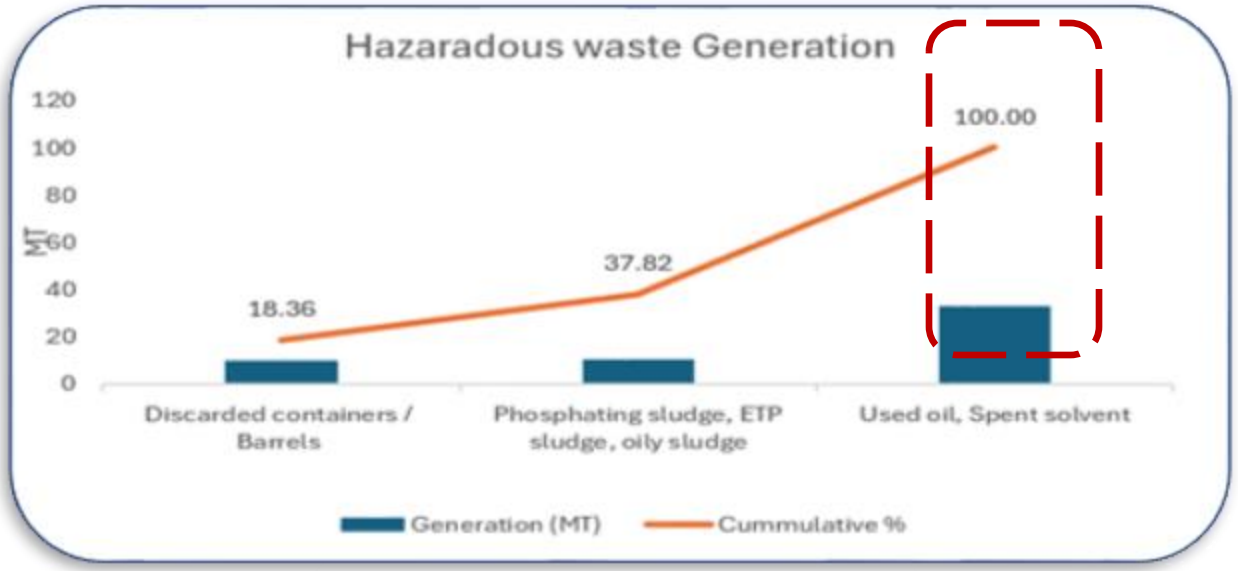
- **Integrated Sand Reclamation Plant** , no additional infrastructure, additional space & additional manpower requirement.
- **Conversion of fines** generated during reclamation process to **Paver Blocks**.
- **In-house fabricated core crusher** enabling recovery and productive utilization of used core material.
- **Innovative Brick Manufacturing**: Developed a new concept to convert process waste/fines into useful bricks.
- **In-house Hydraulic Oil Recycling**: Used hydraulic oil is recycled internally for reuse, promoting resource conservation.
- **Waste Wood Upcycling**: Waste wood is **creatively reused for furniture and wall partitions**, extending material life and avoiding disposal.
- Circular Economy Approach: Multiple waste streams are transformed into useful resources within the facility, supporting waste minimization and sustainable operations.
- Recycling of **waste paper to new paper**.

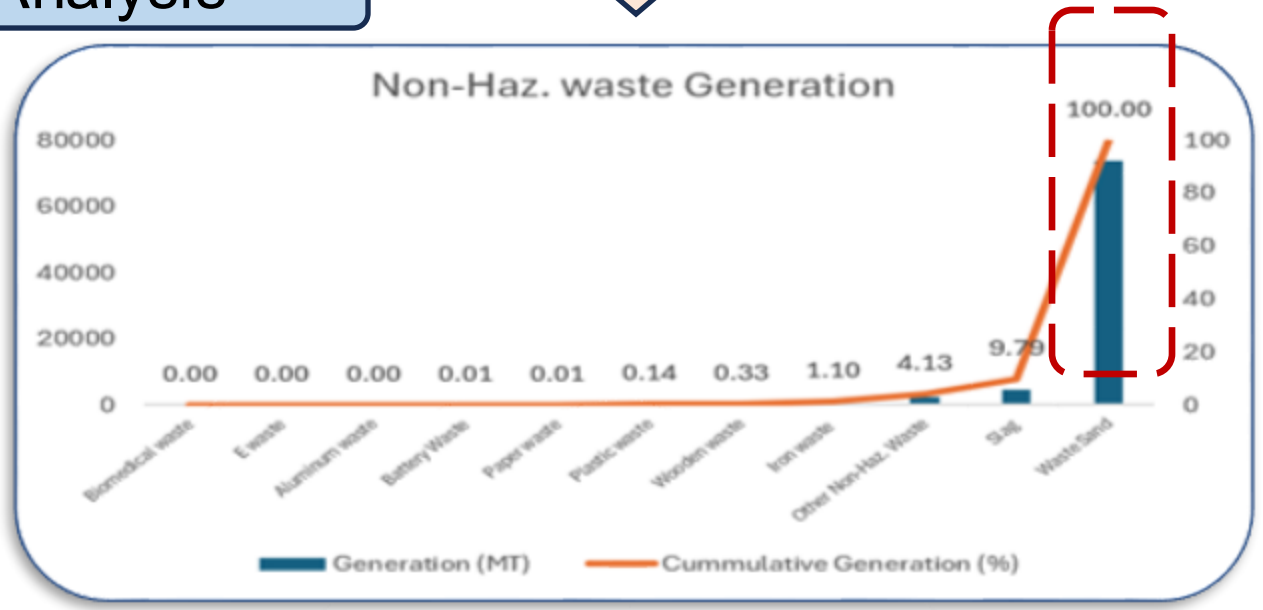
- Waste Generation Trend :





Pareto Analysis



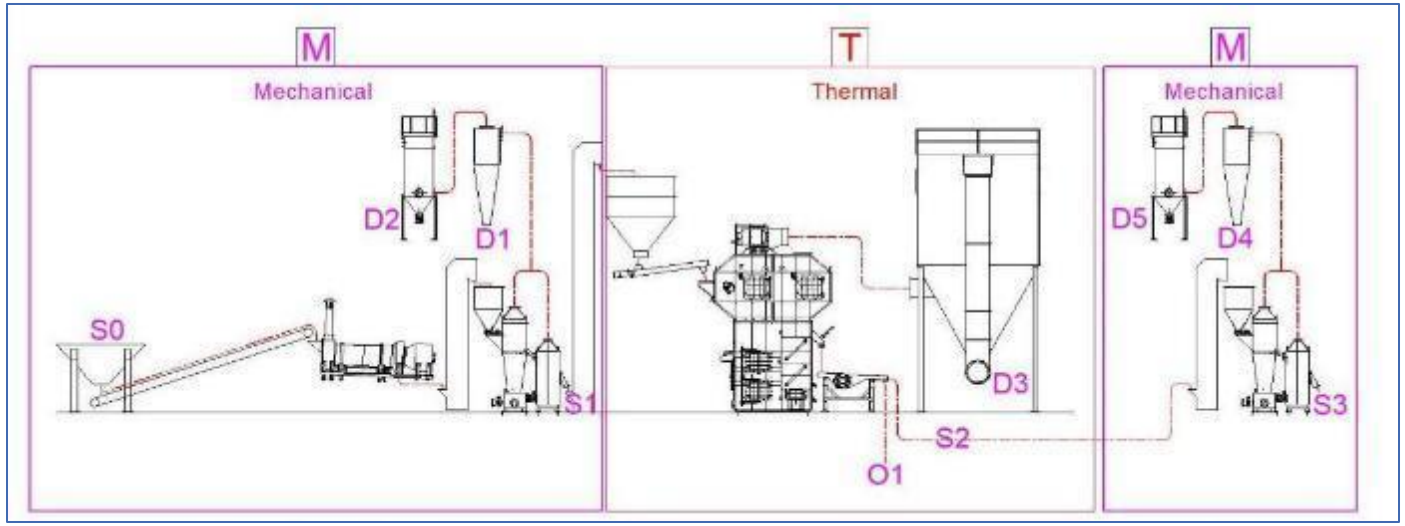


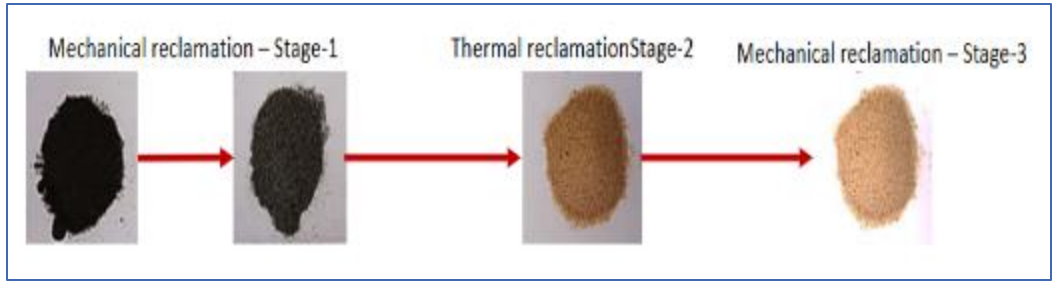
Circular Economy Initiatives : Integrated waste sand reclamation plant

- The organization has **in-house integrated mechanical as well as thermal sand recycled plants** at its Pulivalum and Jhagadia plant to reclaim waste molding sand.

- Waste foundry sand gets reclaimed through mechanical & thermal reclamation methos, demonstrating strong commitment to resource efficiency and waste minimization.







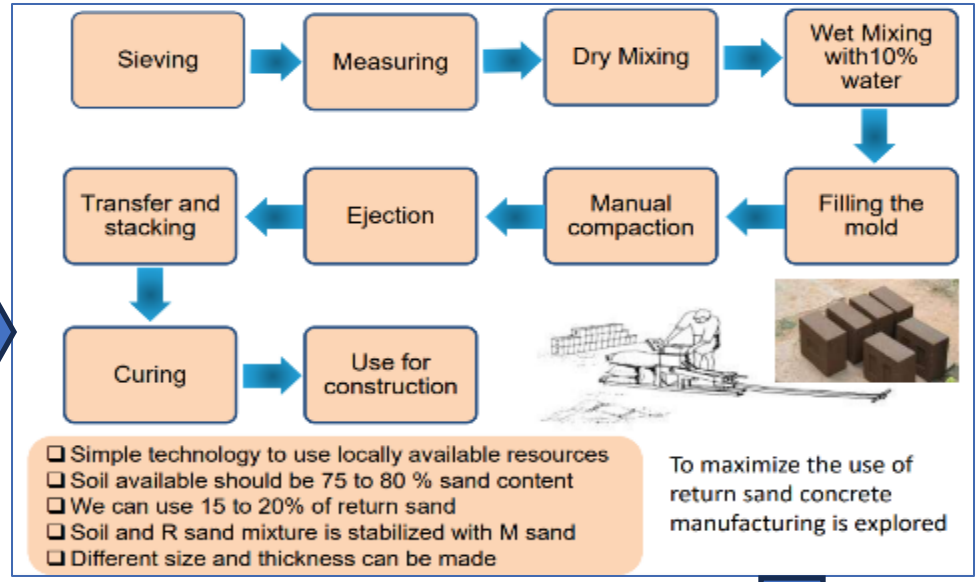
Fines generated from sand reclamation is converted to Paver Blocks



SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
X	Y	X	Y

Circular Economy Initiatives : Solid Waste Re-utilisation in Construction







Stabilised Soil Cement Block Patented Product



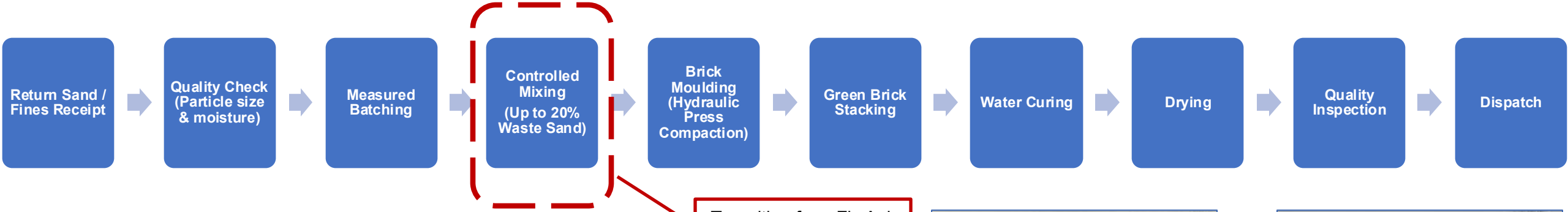






SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
Y	Y	Y	X

Circular Economy Initiatives : Waste to Wealth – Brick Manufacturing Using Waste Foundry Sand *M/s Amokam Build Supply, Ranipet*



Transition from Fly Ash to Waste Foundry Sand for Brick Manufacturing

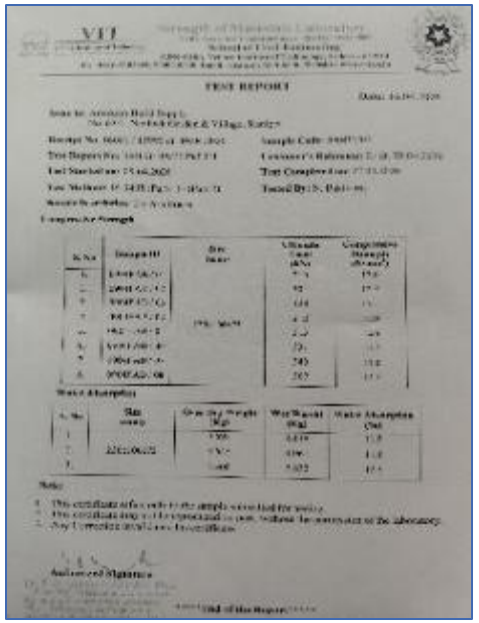


Benefits of Return Sand & Fines in Bricks Production

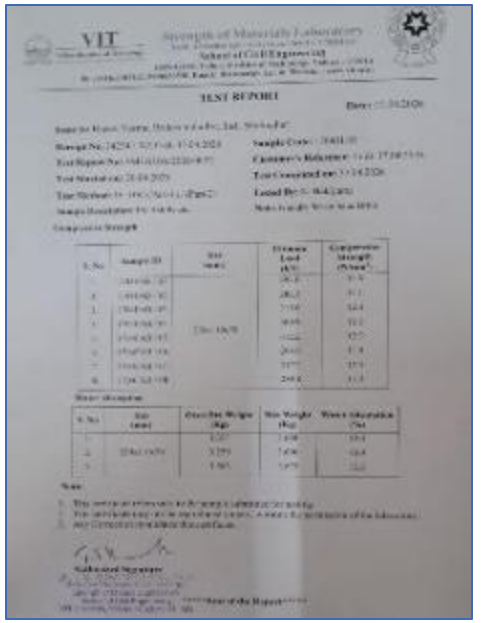
- Acts as an effective fine aggregate replacement
- **Enhances brick density and structural integrity**
- **Reduces shrinkage cracks during curing**
- Improves compressive strength of bricks
- Enables sustainable and circular material utilization

Key Implementation Challenges

- Managing contamination-free disposal of excess sand
- Establishing an efficient system for direct bunker-to-truck material transfer
- Developing effective sieving and segregation mechanisms for contaminated sand



Test Report-Without waste Foundry Sand



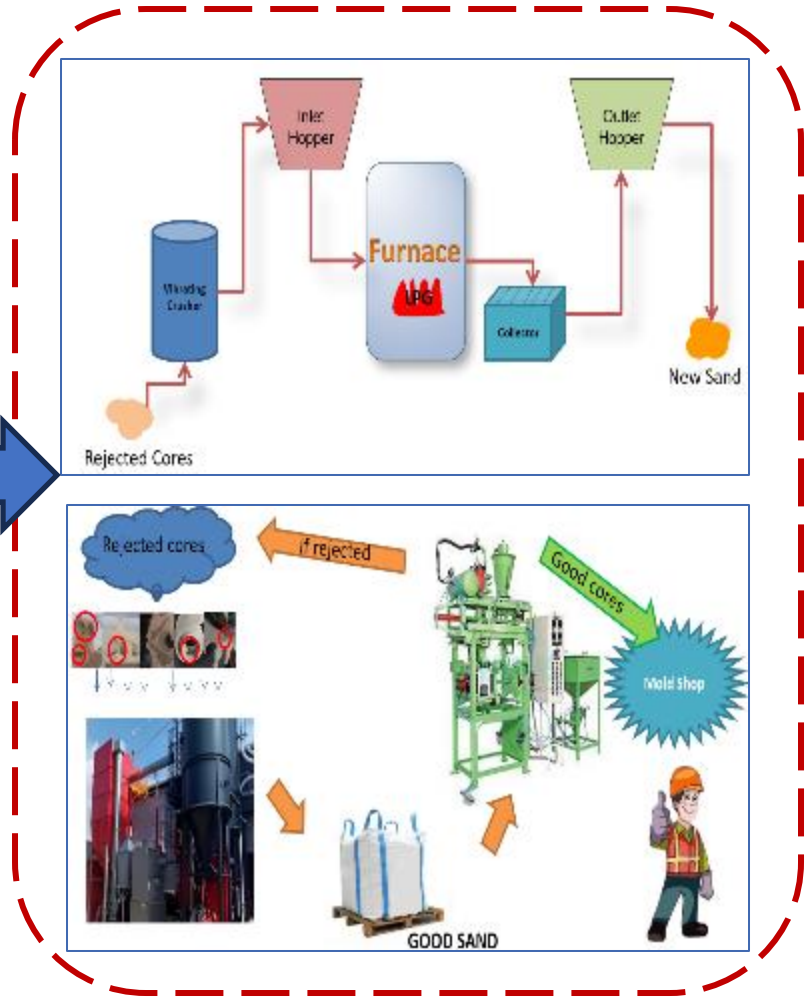
Test Report-With waste Foundry Sand

Outcome: Efficient integration of up to 20% waste sand, ensuring sustainability and product quality

SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
Y	Y	X	X

Circular Economy Initiatives : Core Sand Thermal Reclamation Plant





INVESTMENT

MATERIAL	Cost (Rs)
Machine	2,50,00,000
Relays, ICs, Wires,Stand etc	25,00,000
Others	25,00,000
Total	3,00,00,000

SAVINGS

Direct Saving/Annum)	Cost (Rs) /annum
No of trips cancelled	60
Transit Charges	4,80,000
Indirect Saving	
New Sand Procurement(Tons)	1200
New Sand Procurement(Rs)	96,00,000
TOTAL	1,00,80,000

- Every month about 90 tons of sand saved from mining

SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
X	X	Y (Acts as a central hub for thermal reclamation of three locations)	N/A

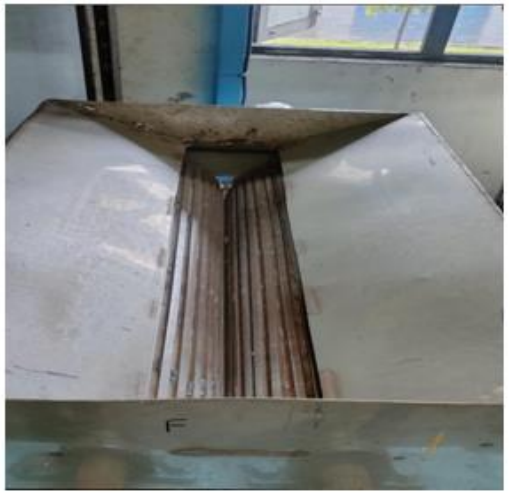
Circular Economy Initiatives : Mechanical Core Sand Reclamation Plant - Inhouse Designed

- **Challenge:** Rejected foundry cores containing **chemical binders and catalysts** required **safe disposal** and created an environmental concern.
- **Existing alternatives were costly:**
  - **Thermal reclamation** was uneconomical for smaller cores
  - Commercial core crusher involved an investment of approximately ₹18 lakhs with a long payback period
- **Innovative in-house designed solution** - Fabrication of a core crusher using scrap materials with minimal investment.
- **Working principle:** Rejected cores are crushed and silica sand is recovered for reuse in new core manufacturing.
- **Quality assurance:** Process validated through trials to ensure required quality standards without affecting casting performance.









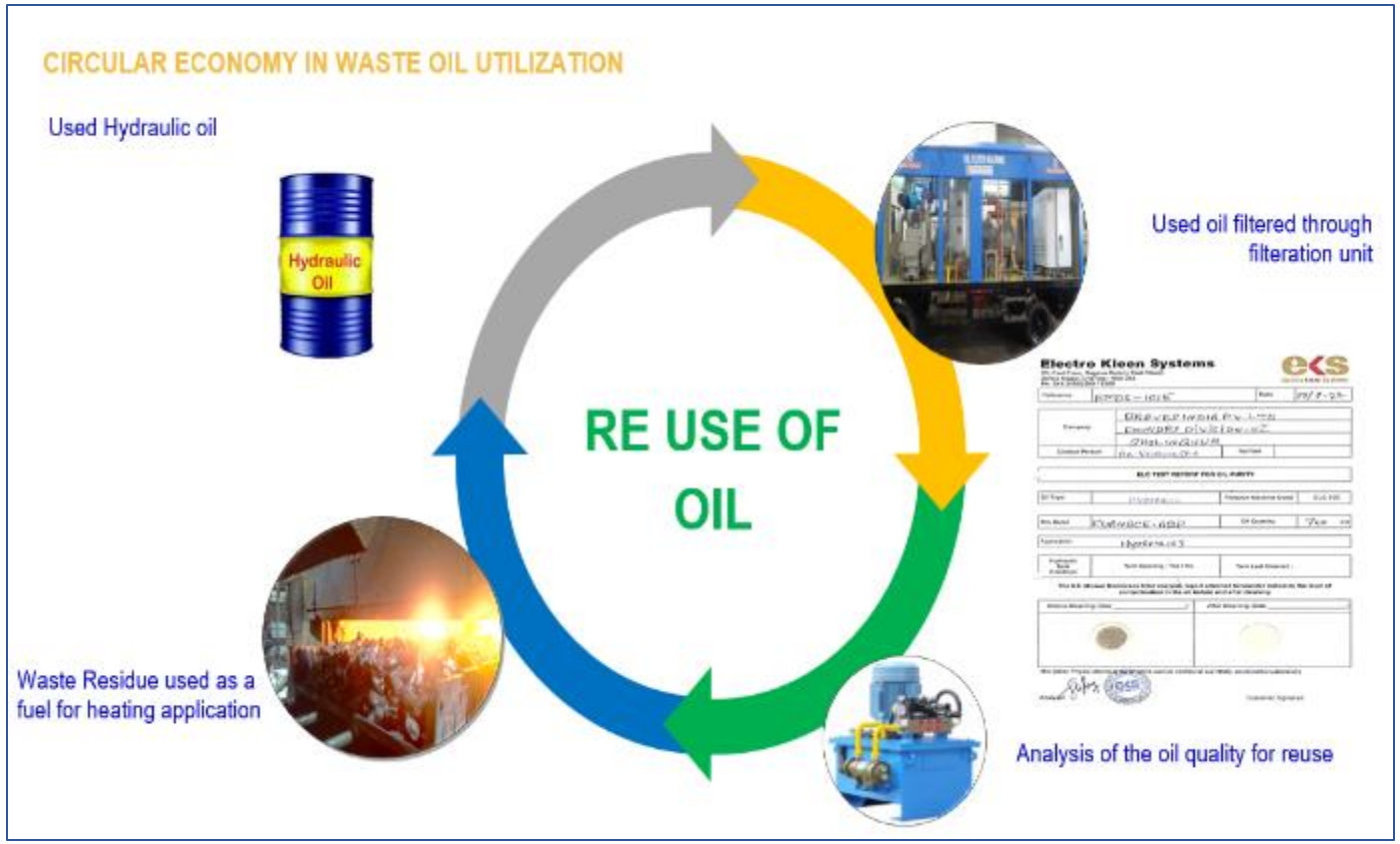
Key Benefits / Results

- **Recycling of waste cores , achieving 100% elimination of hazardous core disposal**
- Improved sustainability and 5S through recovery and reuse of silica sand
- **₹21.67 lakhs total benefit**, comprising **₹5.81 lakhs** annual saving.
- Enhanced employee skills and confidence, with potential for horizontal deployment across foundry lines.

- **Key Message:** Waste Core → Crushing → Sand Recovery → Reuse → Cost Saving + Environmental Benefit

SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
X	Y	Y	Y

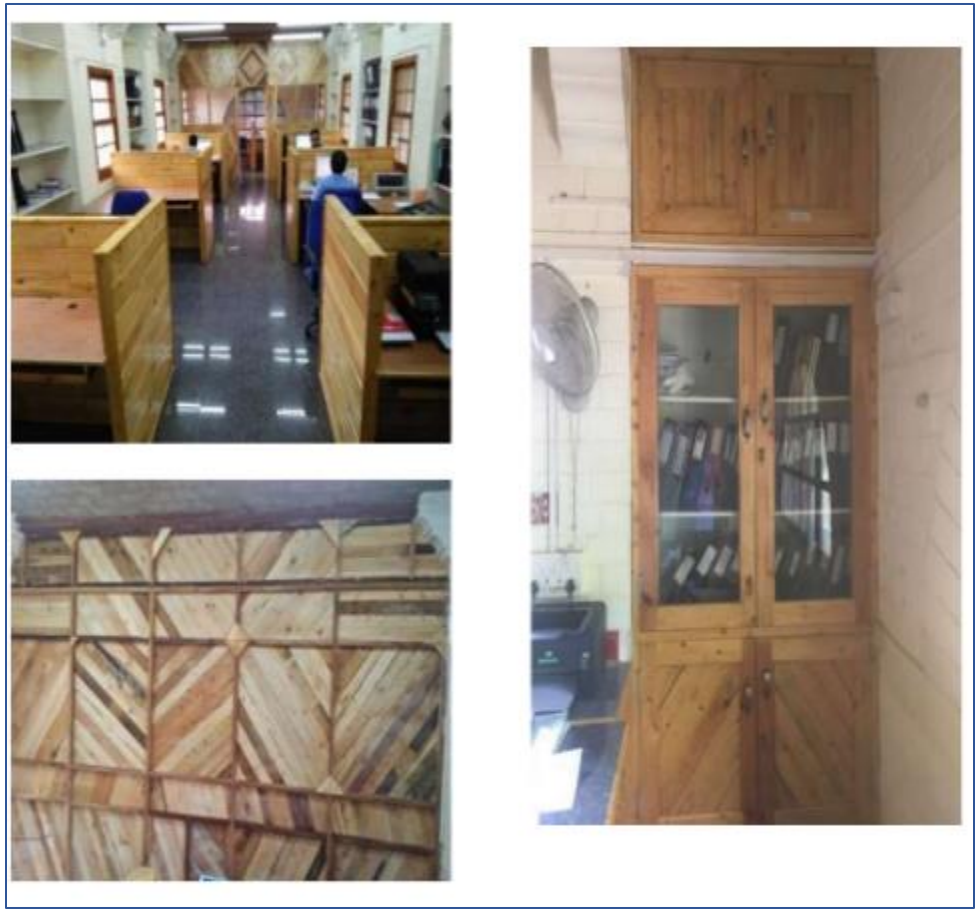
- Circular Economy Initiatives : Reuse of waste Hydraulic Oil after filtration, Transformer Oil and Reuse of Domestic waste-water after treatment in Gardening & Flushes





SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
Y	Y	X	X

• Circular Economy Initiatives : Utilisation of Wooden waste for Office Partition & Furniture



Waste Wood Reuse for Office Furniture and Partition Walls





Waste Wood Upcycling for Kitchen and Dining Area Development at the City Office

- Circular Economy Initiatives : Utilisation of Discarded Steel in Fabrication of new Equipment as well as Structures









SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
Y	Y	Y	Y

- Circular Economy Initiatives : Extraction of Zinc Dust from Induction Furnace Fume Extraction system & being sent to different Industries to use as a Raw material



The Discarded Zinc Dust is being used as an input raw material in different industries.

SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
Y	Y	Y	Y

- Other circular Economy Initiatives : Use of STP sludge along with Garden waste , plastic containers & construction & demolition waste



Garden waste & STP sludge converted to manure



Use of waste plastic containers in plantation



Use of construction & demolition waste in construction work

SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
Y	Y	Y	Y

Other circular Economy Initiatives :Wastepaper Disposal – Closed-Loop Recycling: From Wastepaper to New Paper

1 Vendor identification
Green India / ITC Group recycling partner identified

2 Approval & registration
Top-management approval, vendor registration and Accounts approval

3 Collection & segregation
Wastepaper collected, segregated and packed in gunny bags

4 Vendor intimation
Collection quantity shared with vendor and pickup arranged

5 Weighing & documentation
Wastepaper weighed; Gate Pass and E-Way Bill prepared

6 Dispatch to recycler
Packed wastepaper loaded and dispatched by truck

7 Paper recycling
Collection → Shredding → Pulping → De-inking → Screening → Drying → Reforming

8 New paper returned
Recycled paper bundles received back for use, completing the loop

CLOSED-LOOP PAPER RECYCLING
Waste → Recycle → New Paper → Reuse

PROJECT OUTCOME 9,380 kg wastepaper sent for recycling • 122 new paper bundles received Circular use of paper resources

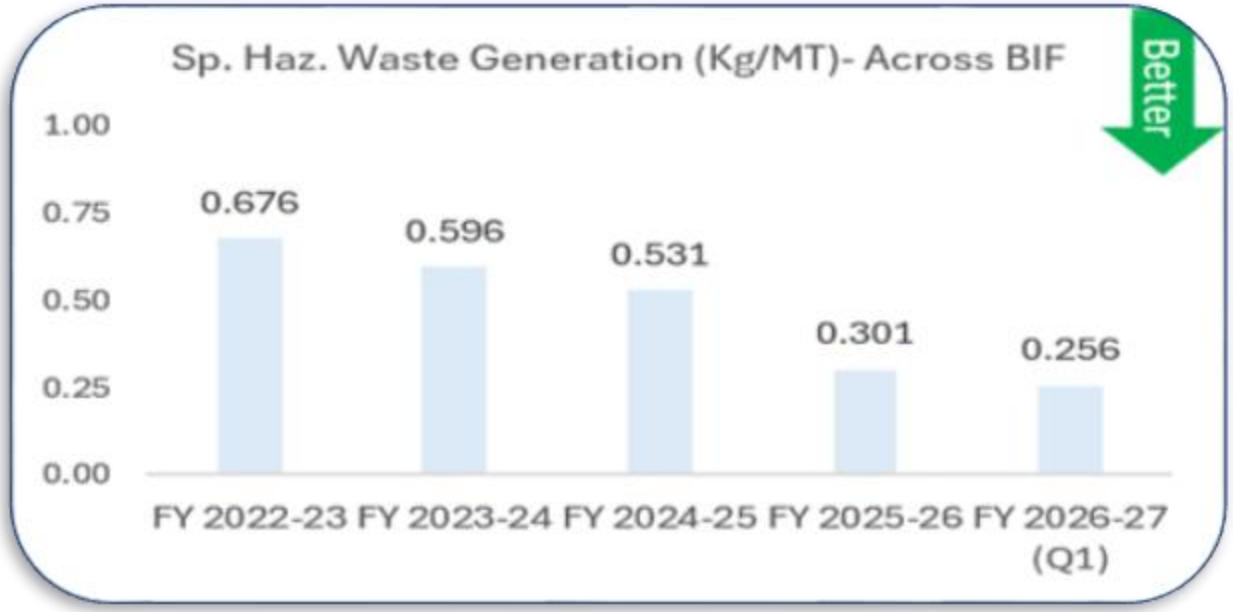


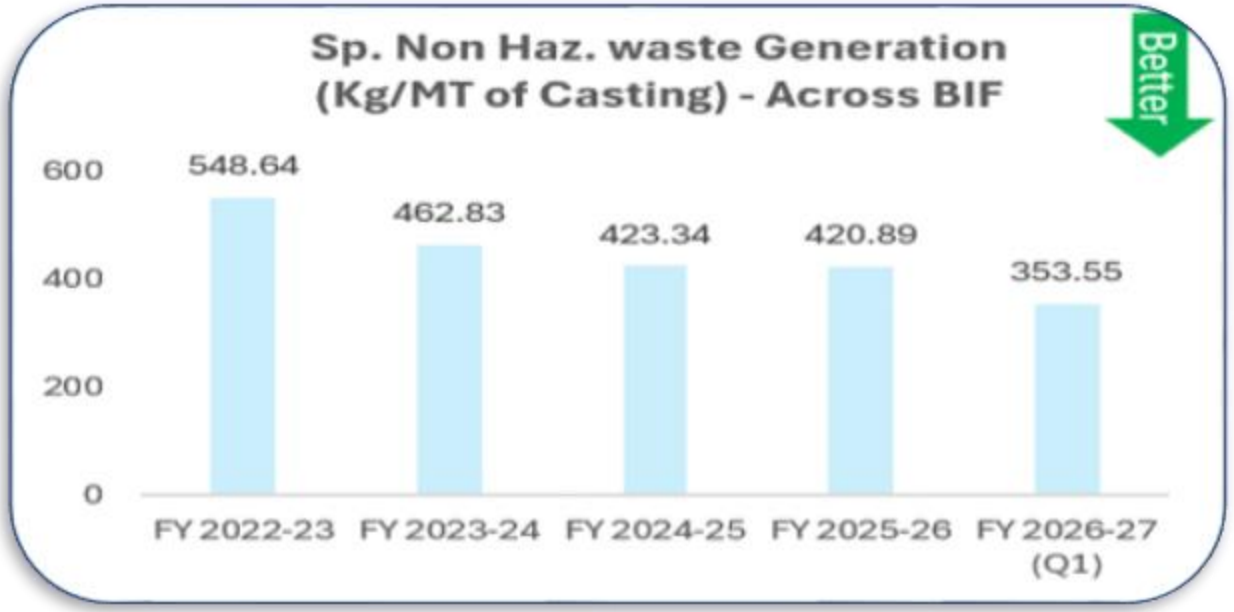


Receipt of new paper as an exchange

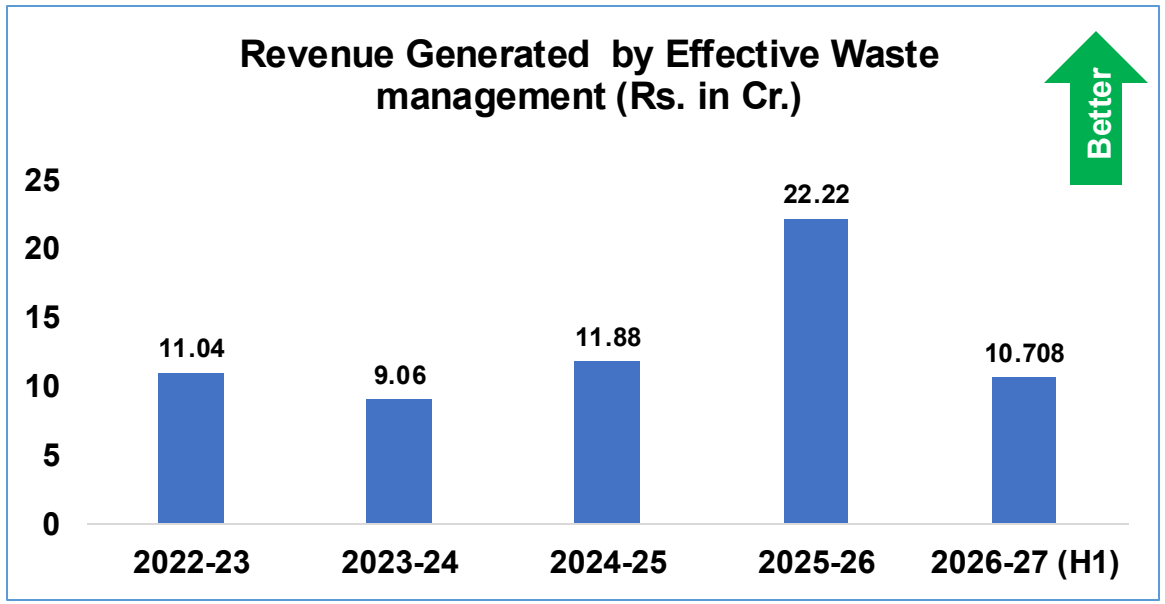
SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA
Y	X	X	X

- # Tangible Benefits





All the Hazardous waste is being disposed through SPCB authorised agencies and it is either recycled/Co-processed or incinerated



© Private and Confidential

- Tangible Benefits

➢ Resource Conservation

i) Sand Circularity

- Approx.**12,000 MT/year of waste foundry sand reclaimed, recycled, and reused** through the integrated sand recycling plant.
- Approx.**10,000 MT/year of waste sand reused in brick manufacturing** and civil works.
- Approx. **40,000 MT/year of waste sand** beneficially reused for levelling low-lying areas.
- Approx. **3,000 MT/year** of **waste core sand reclaimed** for reuse.
- Annual cost savings of **~INR 9.0 Cr through reclamation, recycling, and reuse of waste sand.**

ii) Metal Circularity

- Achieved 98% recycled material utilisation, significantly reducing dependence on virgin raw materials.

ii) Oil Conservation

- Transformer oil filtered, recovered, and reused.
- Hydraulic oil filtered and reused in-house, extending oil life and reducing fresh oil consumption and waste generation.

➢ Financial Benefits

- Approximately **INR 20 Cr/year** in total revenue generation & **INR 9.0 Cr/year** savings through reduced virgin sand procurement.
- Reduction in waste handling and disposal costs through increased internal reuse and recycling.

➢ Environmental Benefits

- Contribution toward a lower embodied carbon footprint through resource recovery, recycling, and reuse.
- Reduced dependency on virgin sand mining and associated natural-resource depletion.
- Reduced waste disposal and landfill burden through circular utilisation of foundry sand.

• Intangible Benefits

➢ **People & Society Benefits**

- Conservation of natural resources.
- Supports sustainable manufacturing.

➢ **Morale & Motivation**

- Employee ownership of circular-economy initiatives.
- Increased sustainability awareness.

➢ **Skill Upgradation**

- Expertise in sand reclamation.
- Resource recovery engineering.

➢ **Attitude Transformation**

"Waste is a Resource" mindset established across the organization.

➢ **Other Benefits**

- Enhanced ESG performance.
- Reduced environmental footprint.
- Industry leadership positioning.

• Replication Potential Across Sector

➢ Knowledge Sharing Platforms

- Presented on **CII forums like CII Green pro Summit , CII SR Energy Transition Summit** etc. & **received awards.**
- Sustainability conferences organised by **IIF annual IFEX , FAPCCI & received awards**.
- Customer sustainability reviews.

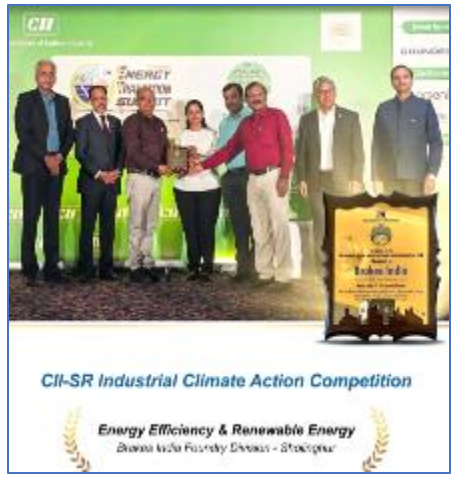
➢ Industry Replication Opportunities

Applicable to:

- Within the Group Companies
- Other Foundry Industries
- Steel plants
- Cement industry
- Auto component manufacturers
- Metal processing industries







➢ Outcome

A scalable industrial circular economy model for Indian Industries / Industrial cluster.

- ## Challenges & Counter Measures

PROJECT / INITIATIVE	KEY CHALLENGE	COUNTERMEASURE
Sand reclamation	Variation in reclaimed sand strength, LOI and consistency	WTS comparison, trials, regular testing; optimize mechanical reclamation and restrict thermal route mainly to core sand
Waste sand → bricks / pavers / civil use	Apprehension of brick manufacturers about quality concern, contamination, segregation and acceptance of waste sand; maintaining product quality	Identification of suitable vendors & confidence building , direct material transfer, controlled batching; validation trials and quality checks from outside agency
Core sand reclamation	Chemical binders/catalysts; commercial solution cost; safe disposal of rejected cores	In-house core crusher using scrap; recover silica sand for reuse; validate casting performance through trials
Hydraulic & transformer oil / treated water reuse	Maintaining recovered-fluid quality and preventing cross-contamination	Filtration, quality verification, controlled reuse and routine monitoring
Waste wood upcycling	Variable size/condition of recovered wood and suitability for reuse	Segregate usable wood; redesign into partitions, furniture, kitchen and dining applications
Discarded steel reuse	Mixed scrap dimensions and fitness for fabrication	Sort and select reusable sections; deploy in equipment and structural fabrication
STP sludge, garden, plastic & C&D waste	Multiple waste streams require segregation and suitable end-use identification	Convert organics to manure; reuse plastic containers in plantation; reuse C&D waste in construction
Closed-loop wastepaper recycling	Segregation, recycler coordination and closing the material loop	Dedicated collection and authorized recycling route; receive recycled paper back as an exchange
Replication / Zero Waste to Landfill	Different plant readiness and sustaining user acceptance/performance	Phased horizontal deployment, SOPs, monitoring and plant-wise implementation plan

- ## Key Learning

Transformation from disposal-centric approach to resource-centric approach.

- Future Plan

PROJECTS	SHOLINGHUR	PULIVALAM	NAIDUPETA	JHAGADIA	PLAN
Integrated waste sand reclamation plant	X	Y	X	Y	• Sholinghur : 2028-29 • Naidupeta : 2027-28
Thermal Core Sand Reclamation Plant	X	X	Y	N/A	• Sholinghur: 2026-27 • Pullivalum : 2027-28
Brick Manufacturing Using Waste Foundry Sand	Y	Y	X	X	• Naidupeta : 2027-28 • Jhagadia : 2027-28
Mechanical Core Sand Reclamation Plant - Inhouse Designed	X	Y	Y	Y	• Sholinghur : 2027-28
Reuse of waste Hydraulic Oil after filtration, Transformer Oil	Y	Y	X	X	• Pullivalum, Naidupeta , Jhagadia 2027-28
Wastepaper Disposal – Closed-Loop Recycling: From Wastepaper to New Paper	Y	X	X	X	• Pullivalum, Naidupeta 2026-27 • Jhagadia : 2027-28
Utilisation of Discarded Steel in Fabrication of new Equipment as well as Structures	Y	Y	Y	Y	N/A
Extraction of Zinc Dust from APCD & selling to other Industries to use as a Raw material	Y	Y	Y	Y	N/A
Use of STP sludge along with Garden waste , plastic containers & construction & demolition waste	Y	Y	Y	Y	N/A
Zero Waste to Landfill Certification	X	X	X	X	Certification for all plants by FY 2027-28

- Major Learnings

- Waste is a valuable resource when managed scientifically.
- Circular economy creates both environmental and business value.
- Resource recovery reduces carbon footprint and costs simultaneously.
- Sustainable manufacturing and profitability can coexist.
- Circular foundry practices support Net Zero transition.
- Replicable models can accelerate sustainability across Indian industry.

- Conclusion : "From Waste to Wealth: Transforming Foundry Waste Streams into Circular Resources for a Net Zero Future."

Brakes India
A TSF Group Company

Thank you.

© Private and Confidential

PARTNERS FOR SAFE MOBILITY