RECYCLING

THE NEXT MEGA TREND?

DISCLAIMER

1) SEBI Registration Status	1) Registered
2) Whether the research analyst or research entity or his associate or his relative has any financial interest in the subject company and the nature of such financial interest.	2) Yes
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8) Whether the subject company is or was a client during twelve months preceding the date of distribution of the research report and the types of services provided.	8) No
9) Whether the research analyst has served as an officer, director or employee of the subject company.	9) No
10) Whether the research analyst or research entity has been engaged in market making activity for the subject company.	10) No

	Conventional		Energy Transition	Global Investments (In USD Bn)[1] 2022	Global Investments (In USD Bn)[1] Annual (FY23 – FY50)[2]	Indian Ecosystem
Consumption End	ICE Vehicles		Electric Vehicles	95	364	
	Conventional Metering Lagging Transmission Capacity		Smart Metering Expansive Transmission Network	332	630	
	Landfilling Of Untreated Waste		Circular Economy	15	329	
	Unabated Fossil Fuel Based Hydrogen		Green Hydrogen	1	170	
Generation End	Fossils Based Generation		Renewable Energy	596	1,173	
	Standalone Hydro Based Storage		BESS and Other Energy Storage	21	170	

WHY ARE WE STUDYING THIS INDUSTRY?

Intrinsic Compounding ✓
@soicfinance

Been studying the waste management space, this is a mind blowing fact on some of the Waste Management cos listed in USA & Canada.

In 2009, during their worst year in at least 2 decades, Waste Management and Republic still managed to produce 25%-30% EBITDA margins on volume/price declines of -8%/-4% and -10%/-1%, respectively. Thereby, showing defensibility of Profits in this space

7:02 PM · Apr 4, 2024 · **27.7K** Views

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WHY ARE WE STUDYING THIS INDUSTRY?

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Topic: Waste Recycling

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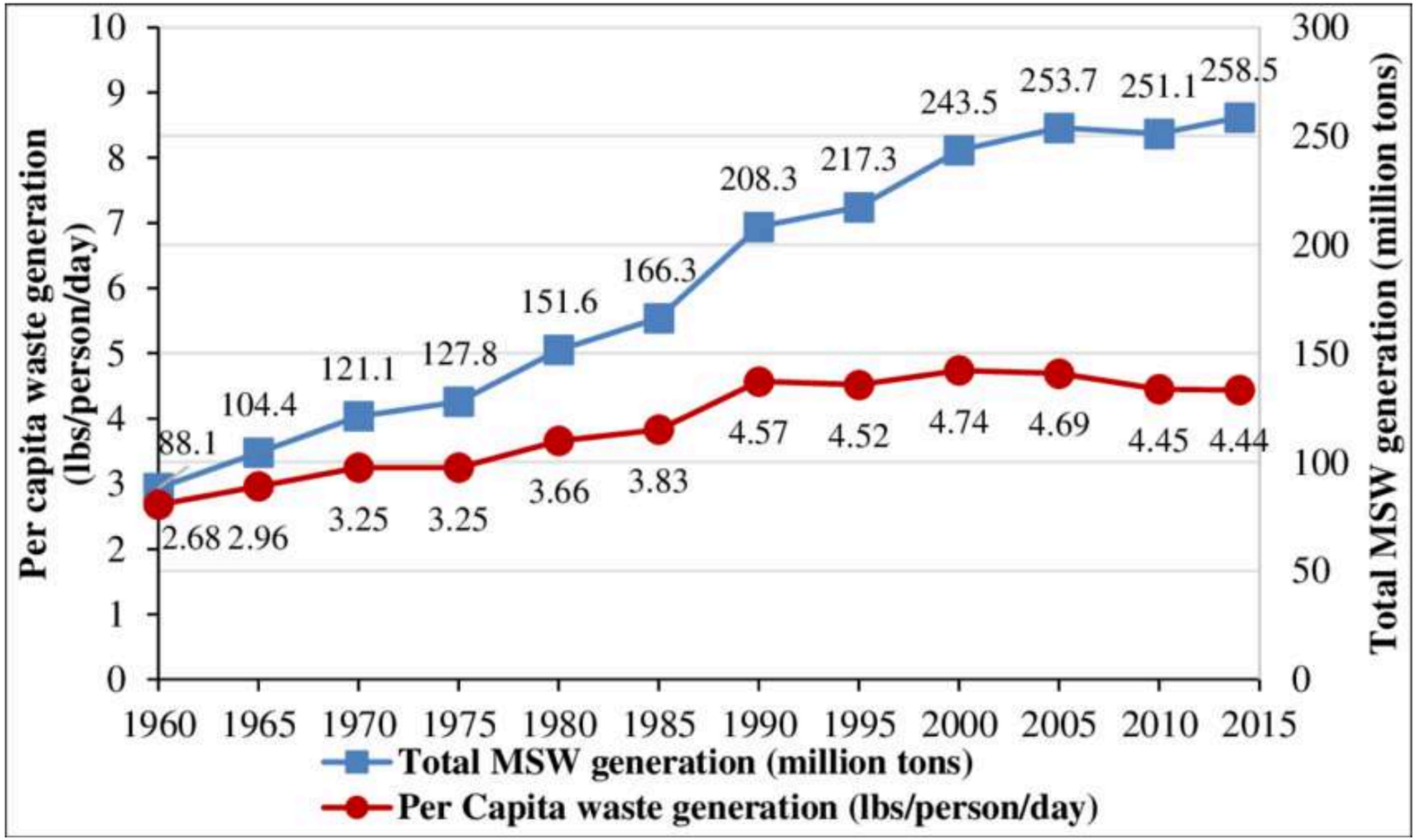

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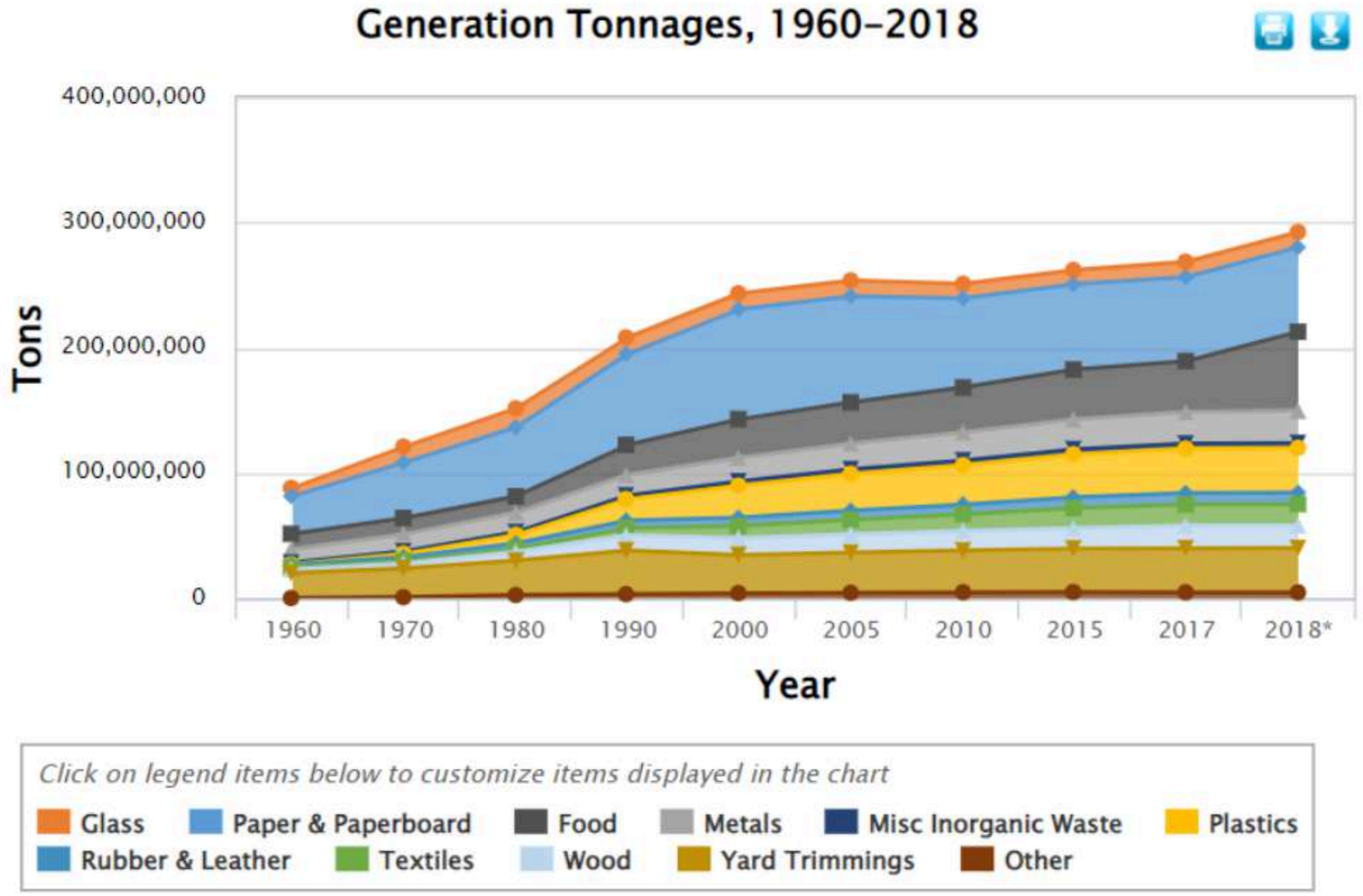

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WHY IS POSSIBLE WITHOUT CHIPS

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WHY ARE WE STUDYING THIS INDUSTRY?

Waste Connections Inc

NYSE: WCN

Overview | Compare

Market Summary > Waste Connections Inc

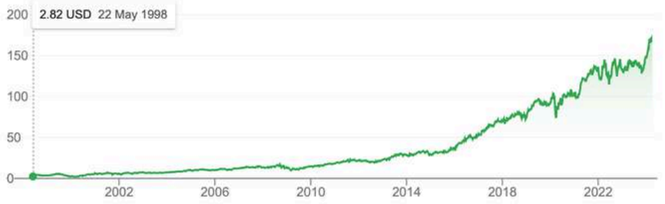
167.29 USD

+164.47 (5,832.27%) ↑ all time

4 Apr, 3:59 pm GMT-4 • Disclaimer

+ Follow

1D | 5D | 1M | 6M | YTD | 1Y | 5Y | Max



Open	169.23	Mkt cap	4.31TCr	52-wk high	173.02
High	170.30	P/E ratio	56.61	52-wk low	126.12
Low	166.99	Div yield	0.68%		

Republic Services Inc

NYSE: RSG

Overview | Compare | Financials

Market Summary > Republic Services Inc

186.82 USD

+169.69 (990.60%) ↑ all time

4 Apr, 3:58 pm GMT-4 • Disclaimer

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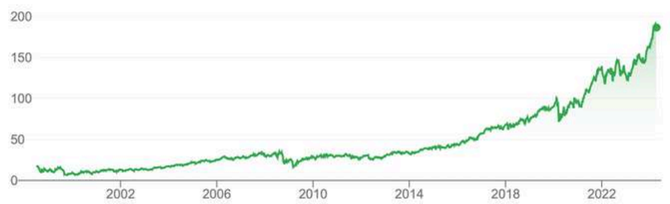
1D | 5D | 1M | 6M | YTD | 1Y | 5Y | Max



Open	190.18	Mkt cap	5.88TCr	52-wk high	192.57
High	190.46	P/E ratio	34.18	52-wk low	133.81
Low	186.44	Div yield	1.15%		

Waste Management, Inc.

Market Summary > Waste Management, Inc.

206.94 USD

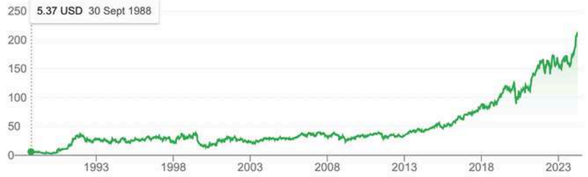
+201.57 (3,753.63%) ↑ all time

4 Apr, 3:57 pm GMT-4 • Disclaimer

NYSE: WM

+ Follow

1D | 5D | 1M | 6M | YTD | 1Y | 5Y | Max



Open	211.35	Mkt cap	8.31TCr	52-wk high	214.54
High	211.52	P/E ratio	36.55	52-wk low	149.71
Low	206.60	Div yield	1.45%		

Feedback

More about Waste Managem… →

Clean Harbors Inc

NYSE: CLH

Overview | Compare | Financials

Market Summary > Clean Harbors Inc

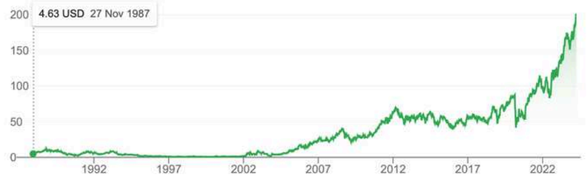
195.94 USD

+191.31 (4,131.97%) ↑ all time

4 Apr, 4:00 pm GMT-4 • Disclaimer

+ Follow

1D | 5D | 1M | 6M | YTD | 1Y | 5Y | Max



Open	198.44	Mkt cap	1.06TCr	52-wk high	202.58
High	201.14	P/E ratio	28.20	52-wk low	129.70
Low	195.86	Div yield	-		

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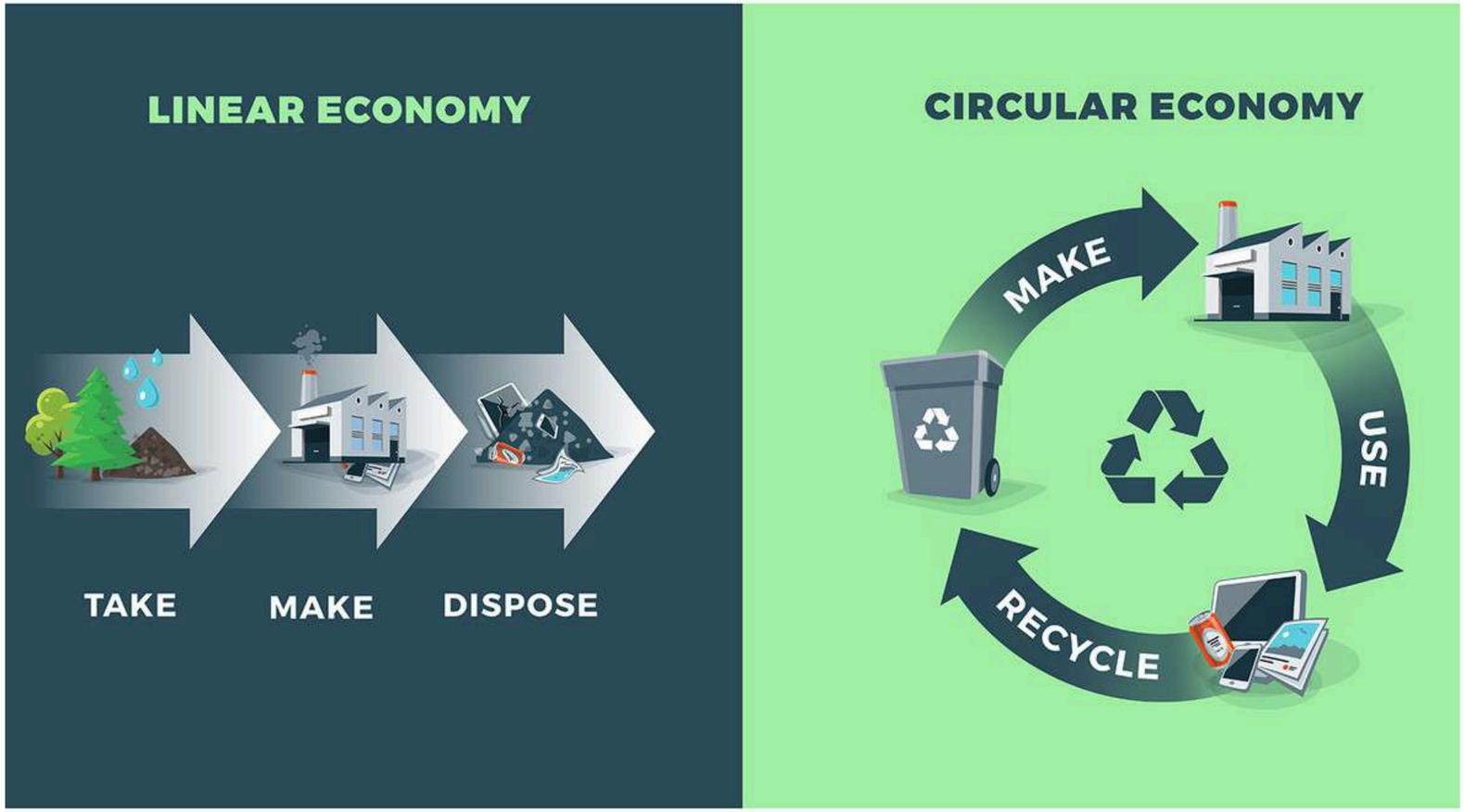
WHAT IS CIRCULAR ECONOMY?



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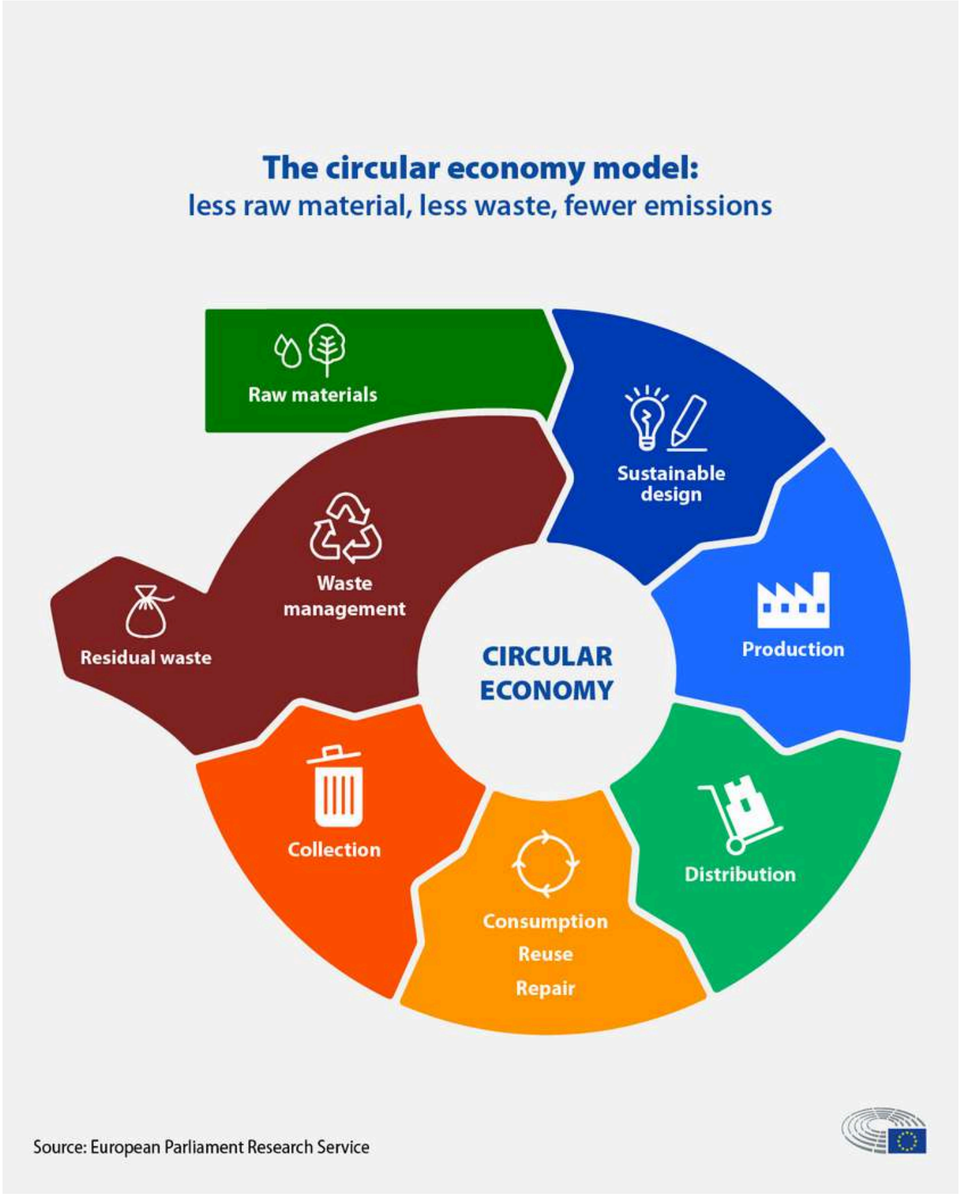

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RECYCLICABILITY OF DIFFERENT MATERIALS

Items that are typically recycled

Type of waste	Scope for improvement in collection rate	Potential improvement in recycling rate	Regulatory focus	Technology disruption	Pollution risk	Emergence of new companies	Market growth potential	Potential size of the market
Plastic waste	High	Medium	High	Medium	High	Medium	Medium	High
E-waste	High	High	High	Medium	High	High	High	High
Battery waste	Low	Low	High	High	High	High	High	Medium
Construction and demolition waste	Medium	Medium	Medium	Low	Low	Medium	Low	Low
Metals (steel and aluminum) waste	Low	Low	Medium	Low	Medium	Low	Low	High
Bio waste	Medium	Medium	Medium	Low	Medium	Medium	Medium	Low
Paper	Low	Low	Medium	Low	Low	Low	Low	High
Rubber	Low	Low	High	Medium	Medium	Low	Medium	Medium
Textile	Low	Low	Low	Low	Medium	Medium	Medium	Low

The subsequent portions of the report are largely focused on select sub-segments of the recycling ecosystem: plastics, e-waste and batteries.

High Medium Low

RECYCLICABILITY OF DIFFERENT MATERIALS

We expect lead recycling to be the most investable play in recycling segment across parameters

Exhibit 3: Scorecard for recycling potential by waste type, basis score (out of 10) along six parameters

Type of waste	Market maturity	Scrap availability	Scrap sourcing	Recyclability	Regulatory catalyst	Formalization potential	Total
Lead	8	8	6	10	9	8	49
Plastic	7	5	6	5	8	7	38
Aluminum	9	3	3	10	6	5	36
Steel	7	4	7	9	5	4	36
E-waste	5	7	5	5	7	5	34
Lithium	1	1	1	7	7	4	21

Source: Kotak Institutional Equities estimates

RECYCLICABILITY OF DIFFERENT MATERIALS

- **Lead recycling—on the brink of rapid formalization**

  Lead is one of the most recycled metals in the world; secondary lead contributed to 80%+ of total lead production in India in CY2022. This is due to: 1) infinite recyclability, 2) lower extraction and capex costs (versus primary lead) and 3) 95%+ recyclability of a single LAB. Domestic lead recycling has hitherto been largely informal (~65% in FY2023), but we expect policy tailwinds such as BWMR to reduce unorganized market share to below 10% by FY2033E. LABs are the most common end-use for lead, and the automotive sector is the largest end-use for LABs. This exposes LABs to the risk of obsolescence from EVs, where li-ion batteries are most commonly used for motive power. We believe the threat of declining LAB market size is overblown, and estimate LAB market growth for at least another decade.

- **Plastics: Environmental aspects to act as an enabler**

  Concerns about plastic waste have dominated public discourse on plastic use/substitution; we see the Plastic Waste Management Rules 2022 (PWM), notified in 2022 as the first step to improve traceability in the plastics ecosystem. Like BWMR, the focus is on EPR, wherein the producers, importers and brand-owners (PIBOs) are responsible for environmentally sound management of plastic waste; however, regulatory enforcement is still weak. Plastics undergo change in chemical, thermal and impact resistance properties when recycled – unlike metals. The domestic ecosystem for plastic recycling is yet to mature due to: 1) issues pertaining to the collection of plastic (other than rigid/category 1 plastics), 2) sorting of complex plastic types and 3) concerns about recycled plastics' properties versus virgin plastics. We believe that this poses an incentivization problem—compliance with the PWM rules will be a function of enforcement, and we expect it to pick up meaningfully only in the medium to long term.

- **Aluminum recycling industry—Secondary aluminum growth outperforming primary**

  Indian aluminum demand in FY2023 stood around 4.5 mn tons, of which ~40% was recycled/secondary aluminum. Secondary aluminum growth has outpaced primary aluminum growth in the past 7-8 years, and is preferred by auto OEMs, owing to cost benefits, including the presence of alloy materials in the scrap. Advantages of secondary aluminum include: 1) lower capex cost 2) 90-95% lower production costs and 3) better ESG metrics. The lack of domestic scrap availability is a headwind; however, we expect it to be mitigated, in line with India's economic development and institutionalization of scrap collection value chain in the coming years.

- **Lithium-ion Battery (LIB) Recycling—Yet to take off**

  The global EV battery recycling industry is yet to take off, in line with the shift to EVs. These batteries typically enter recycling after 8-10 years, and the first global batch of batteries is expected to hit the recycling market by around 2030. However, recycling value chains for LIBs are far from established. The key reasons for this include: 1) volatile battery material prices, 2) concentration of key metals used in current generation of batteries and 3) continuously changing battery chemistries. Indian players lag international peers due to a lack of established technologies, but we expect this gap to be bridged as the overall ecosystem matures.

- **E-Waste:** Scrap availability is increasing at a rapid pace; however, the lack of technology and presence of hazardous materials are key hurdles restricting growth.

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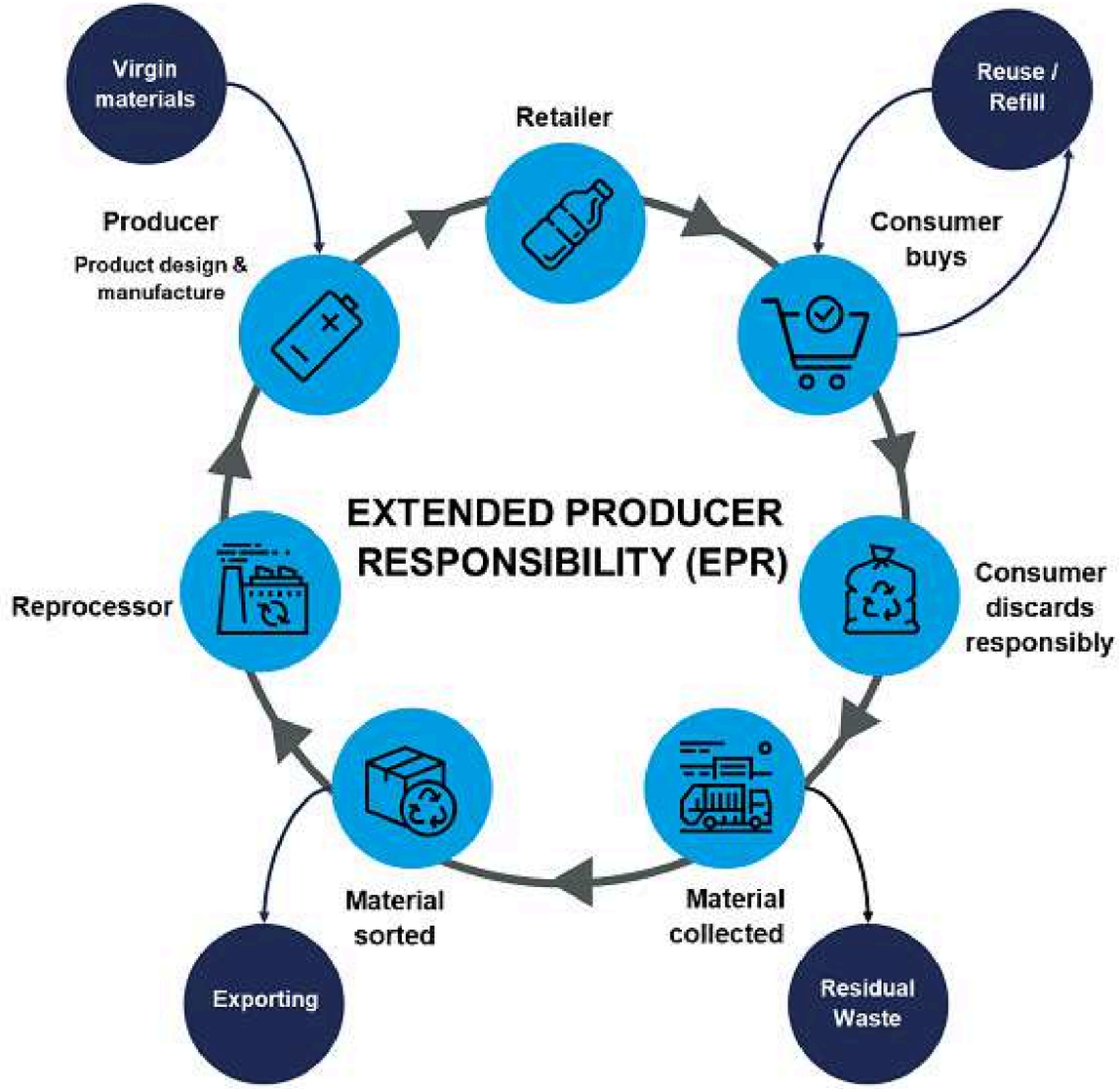

WHY ARE WE STUDYING THIS INDUSTRY?

The Guidelines on Extended Producer Responsibility (EPR) for plastic packaging vide Plastic Waste Management (Amendment) Rules, 2022, on 16th February 2022. The Guidelines stipulate mandatory targets on EPR, recycling of plastic packaging waste, reuse of rigid plastic packaging and use of recycled plastic content. 23 Mar 2023

PIB
https://pib.gov.in › PressReleaseIframePage

Extended Producer Responsibility guidelines - PIB

EPR mandates that all waste batteries to be collected and sent for recycling/refurbishment, and it prohibits disposal in landfills and incineration.

Aleph INDIA
https://alephindia.in › epr-registration-for-battery-waste...

EPR Registration for Battery Waste Management - Aleph INDIA

DIFFERENT TYPES OF RECYCLERS

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DIFFERENT INDIAN COMPANIES AND THE ROLE WHICH THEY PLAY

GANESHA ECOSPHERE LIMITED

PLASTIC

LEAD

WASTE

AUTO SCRAP

E WASTE

WATER

WATER

CARBON BLACK

LEAD

TYRE

TYRE

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BATTERY WASTE MANAGEMENT RULES AND EXTENDED PRODUCER RESPONSIBILITY

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Topic: Waste Recycling

BATTERY WASTE MANAGEMENT RULES 2022

- Honourable Prime Minister Shri Narendra Modi has highlighted the nation's focus on circular economy in his address at a post-budget webinar on March 4, 2022. On these lines, the Ministry of Environment, Forest and Climate Change (MOEFCC) launched the Battery Waste Management Rules, 2022 (BWMR, or 'Rules') on August 24, 2022.

- The rules focus on encouraging recycling of spent batteries by mandating Extended Producer Responsibility (EPR) and are applicable to multiple battery technologies.

- The Indian recycling industry is yet to achieve maturity and is dominated by unorganized players, leading to substantially lower recycling rates compared to the West. Government policies are gradually addressing these challenges.

- Recycling rate in India (~20%) is significantly lower than the West (60-80%) due to a large informal sector, the lack of a policy framework and inadequate collection infrastructure.

- The BWMR imposes Extended Producer Responsibility (EPR) on battery producers, holding them accountable for the collection, recycling and use of recycled materials in new batteries.

- This should significantly increase lead scrap availability for organized players and shrink the unorganized sector over the next 3-5 years.

- Extended Producer Responsibility (EPR) was added to the draft rules to address the need for recycling of batteries across portable, automotive, industrial, and electric vehicle battery industries.

- EPR mandates manufacturers and producers to be accountable for the collection, storage, transportation, recycling, and disposal of spent batteries.

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BATTERY WASTE MARKET STRUCTURE

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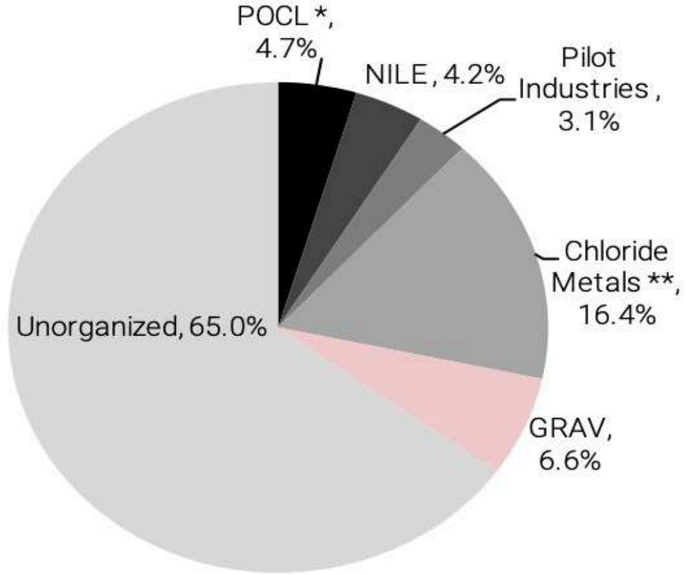
Topic: Waste Recycling

BATTERY WASTE MANAGEMENT RULES 2022

GRAV's capacity share in domestic market is mere ~6%

Exhibit 5: Domestic capacity split between large organized players and unorganized players, FY2023



Note:
1) *POCL refers to Pondy Oxides and Chemicals Limited
2)** Chloride metals is 100% subsidiary of Exide

Source: Companies, Kotak Institutional Equities estimates

BATTERY WASTE MARKET STRUCTURE

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Topic: Waste Recycling

BATTERY WASTE MANAGEMENT RULES 2022

Building a Green World through Recycling

GRAVITA
We Recycle to Save Environment

Unwavering commitment to sustainability- driven values continues to light the growth path.

Vision

To be the most valuable company in the recycling space globally.

Mission

Rank among the top five global recycling companies by 2026, driven by

- *Diversification*
- *Sustainable growth*
- *Eco-friendly innovation*
- *Stakeholder value creation*

Core Values

- *Fairness*
- *Trust*
- *Respect*
- *Passion*
- *Nurturing Relationship*

Social Responsibility

- *Community development*
- *Advance education*
- *Combat hunger*
- *Safeguard the environment*

Business Verticals

Existing:

- *Lead*
- *Aluminium*
- *Plastic*
- *Rubber*
- *Turnkey Solutions*

Upcoming Diversifications:

- *Lithium-ion*
- *Steel*
- *Paper*

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BATTERY WASTE MARKET STRUCTURE

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BATTERY WASTE MANAGEMENT RULES 2022

GRAVITA
We recycle to save environment

OUR PARTNERS
(Strong Partnering Capability)

AMARA RAJA
Gotta be a better way
TATA batteries
LUMINOUS
CLARIOS
EXIDE
OCTAL
samvardhana motherson
DOHA CABLES
Panasonic
Nilkamal
TRAFIGURA
INDORAMA VENTURES
Korea Zinc.Co.,Ltd.
Ducab
SANDHAR
Growth. Motivation. Better Life
POLYCAB
asianpaints
HITACHI
thyssenkrupp
GLENCORE
TVS
HT
Honda Trading
TATA
KEC
KEC INTERNATIONAL LIMITED
KEI
Wires and Cables
The power behind the power™
AL DOBOWI
TOYOTA TSUSHO
PHILIPS
Lighting

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BATTERY WASTE MARKET STRUCTURE

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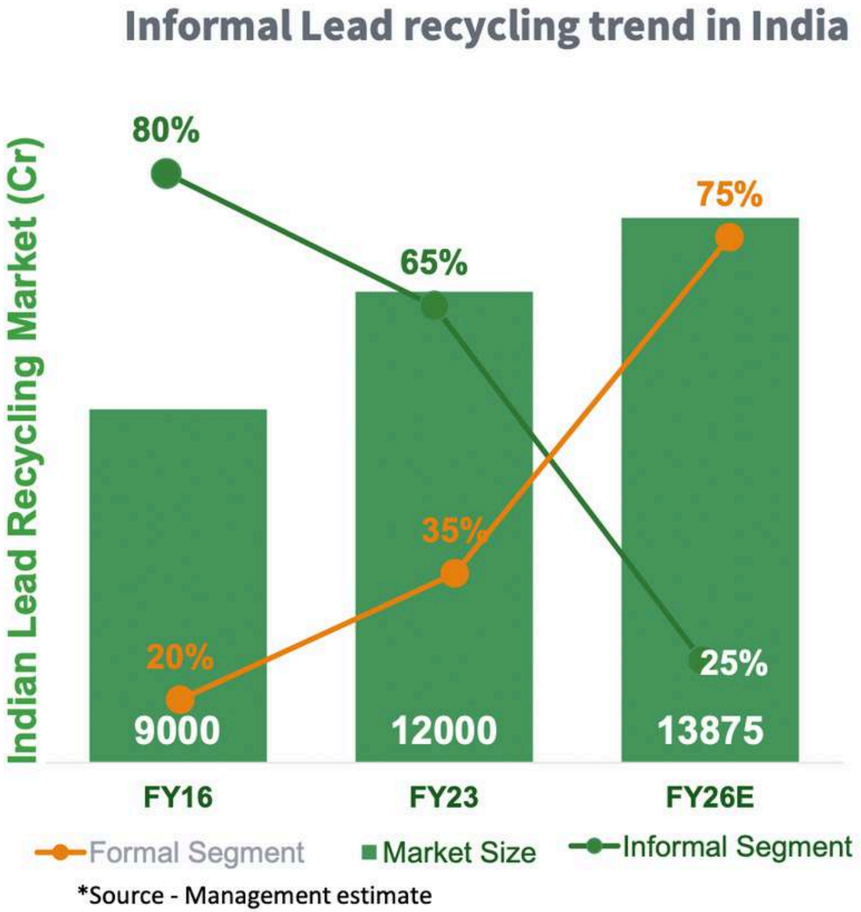
BATTERY WASTE MANAGEMENT RULES 2022



*Source - Management estimate

Shift from **INFORMAL TO FORMAL**

With redefining of Battery Waste Management Rules (BWMR) , Extended producers responsibility (EPR) and stricter implementation of GST, the scrap availability for formal recycling sector has increased and is further expected to grow.

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BATTERY WASTE MARKET STRUCTURE

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BATTERY WASTE MANAGEMENT RULES 2022

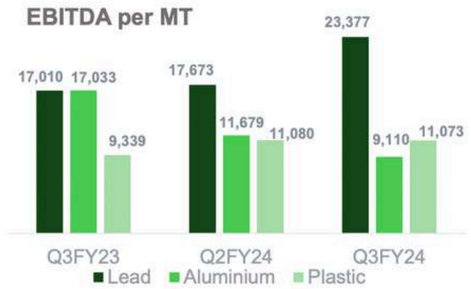
QUARTERLY HIGHLIGHTS - Q3 FY24

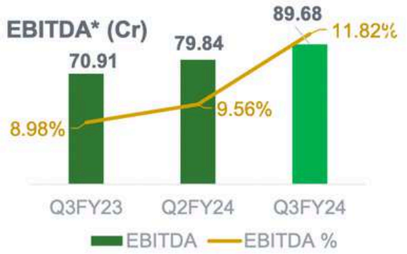
GRAVITA
We recycle to save environment

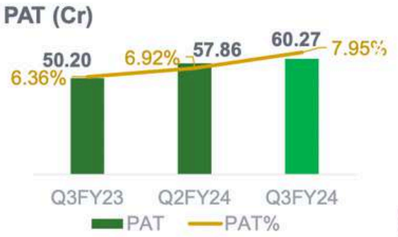
Riding Higher - **VISION 2027**

-7%	-4%	26%+	20%+
Volume Y-o-Y	Revenue Y-o-Y	EBITDA Y-o-Y	PAT Y-o-Y

- **42%** Revenue from Value added products
- **36%** Revenue from Overseas Business
- **17%** Y-o-Y Increase in Production







*Revenue / EBITDA after adjustment of income/loss from Currency & Metal hedging

BATTERY WASTE MARKET STRUCTURE

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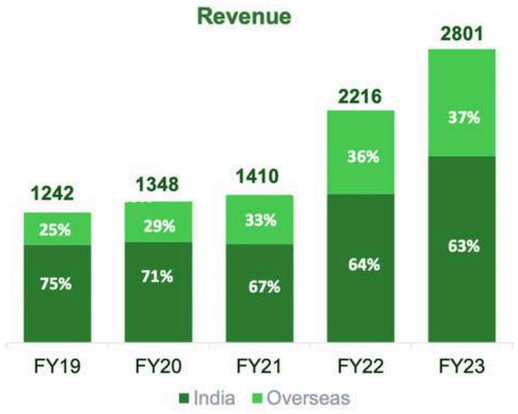
Topic: Waste Recycling

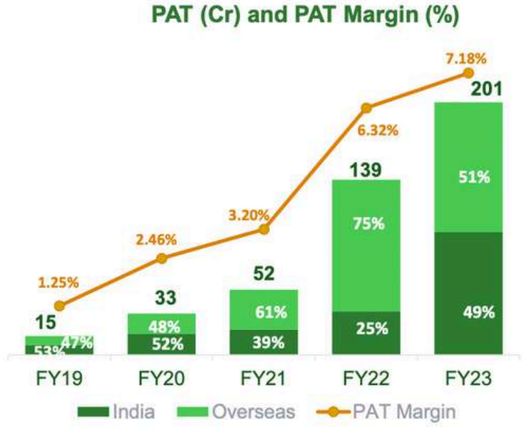
BATTERY WASTE MANAGEMENT RULES 2022

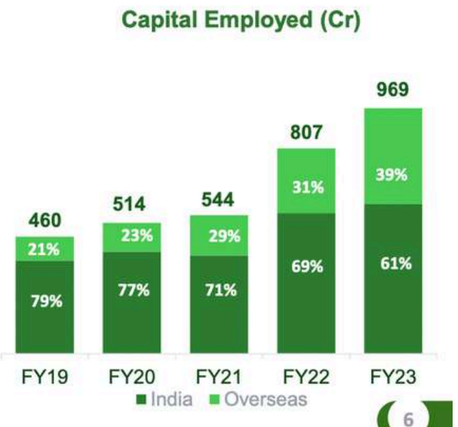
FINANCIAL Highlights

GRAVITA
We recycle to save environment

- **22 %** Revenue CAGR - 5 Yrs
- **9-10%** Consistent EBITDA margins
- **A+** External credit rating from ICRA
- **35 %** PAT CAGR - 5 Yrs
- **Locking the margins** Back-to-back hedging mechanism in place
- **12 Years** History of sustainable dividend payouts
- **40 Cr +** Reduction in Debt in FY 2023







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BATTERY WASTE MARKET STRUCTURE

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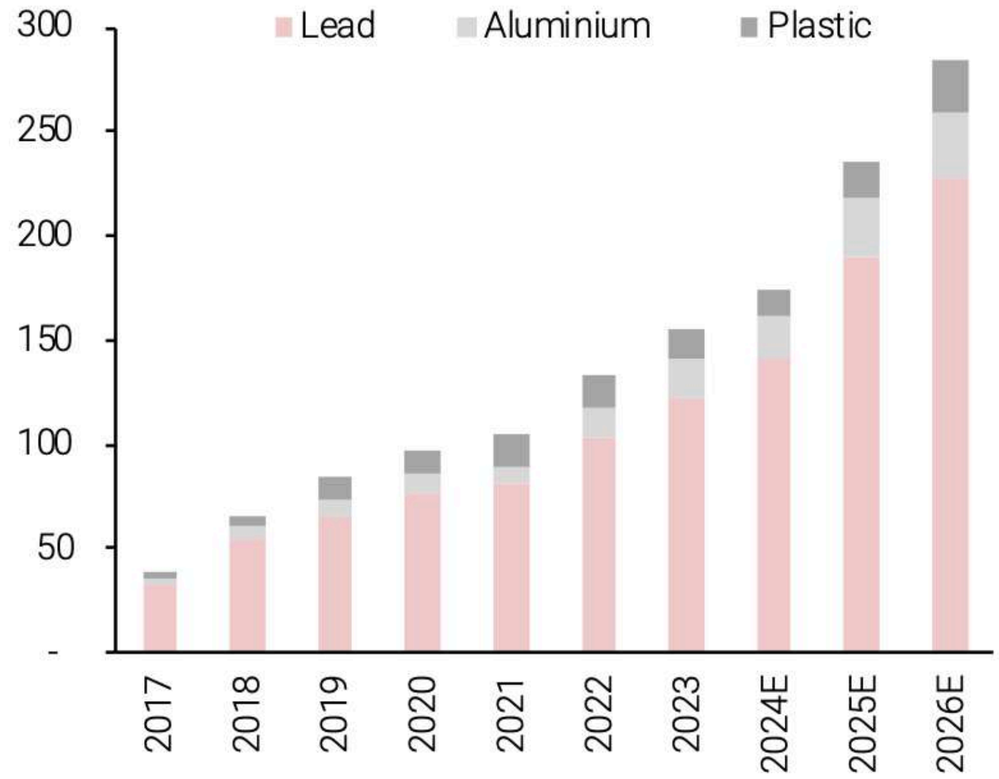
Topic: Waste Recycling

BATTERY WASTE MANAGEMENT RULES 2022

We expect lead to remain the dominant segment for GRAV

Exhibit 6: Segmental share in GRAV volume mix, March fiscal year ends, FY2017-26E (ktpa)



Source: Company, Kotak Institutional Equities estimates

GRAV has plans to significantly increase its recycling capacity to 435 ktpa by FY2026E–up 86% from 234 ktpa in FY2023

BATTERY WASTE MARKET STRUCTURE

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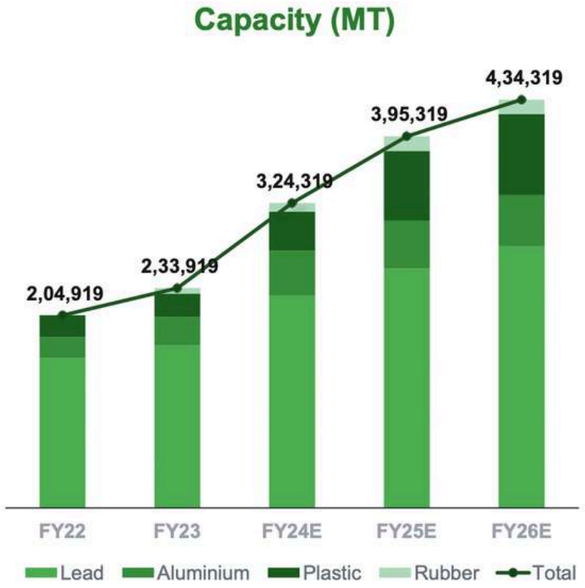
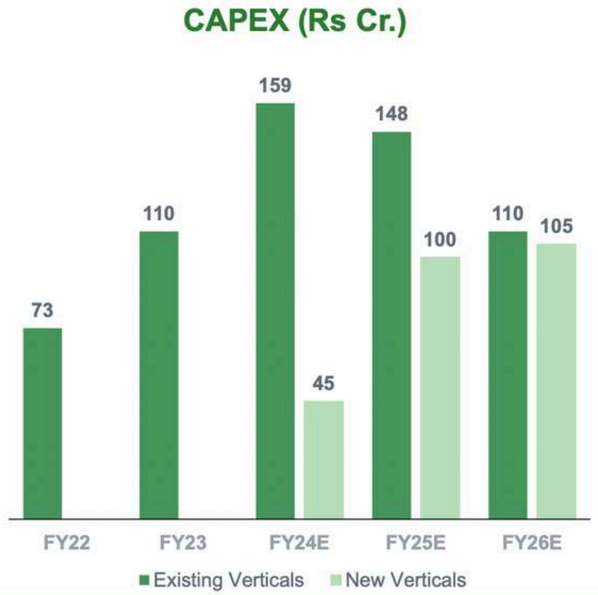
BATTERY WASTE MANAGEMENT RULES 2022

Capacity Expansion & CAPEX over the Years

GRAVITA
We recycle to save environment





4,25,000 MTPA Capacity planned by FY 2026

Rs. 600+ Cr Capex planned by FY 2026

BATTERY WASTE MARKET STRUCTURE

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BATTERY WASTE MANAGEMENT RULES 2022

GRAVITA
We recycle to save environment

GLOBAL & PAN INDIA Operations

- Global spread helps reduce logistics costs and procure material cheaper.
- Start small > grow volumes > establish new plants close to procurement sources.
- Increased flexibility in recycling closest to raw material access and consuming markets.

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BATTERY WASTE MANAGEMENT RULES 2022

Project Updates

GRAVITA
We recycle to save environment

Tanzania	• Started commercial production of plastic at its existing recycling plant • Capacity – 1,800 MTPA • Capex – Rs. 2.25 Cr. From internal accruals
Togo	• Started commercial production of lead from its existing recycling plant • Capacity – 6000 MTPA • Capex – Rs. 3.61 Cr. From internal accruals
Chittoor	• Increased capacity of Lead recycling to 64,640 MTPA • Capex - Rs.21 Cr. from internal accruals
Tanzania	• Started Rubber Recycling • Capacity of 3,000 MTPA • Capex – Rs.3.86 Cr. from internal accruals
Mundra	• Increased capacity of Lead recycling to 60,000 MTPA • Started Value Added Production of Red Lead with a Capacity of 4,800 MTPA • Started Plastic Recycling with a Capacity of 7,500 MTPA
Oman	• Gravita signed MOU to establish Battery Recycling Plant through JV • Capacity of 6,000 MTPA in Phase 1 • Gravita's first recycling facility in Middle East

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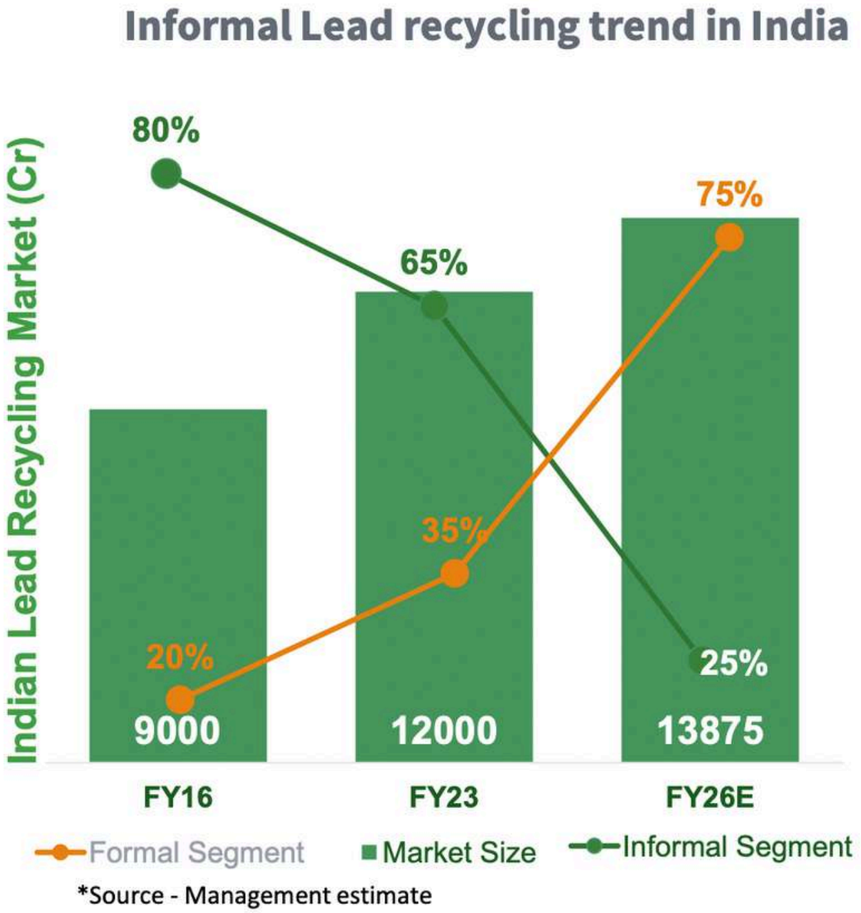
BATTERY WASTE MARKET STRUCTURE

Brought to you by SOIC
Topic: Waste Recycling

BATTERY WASTE MANAGEMENT RULES 2022



*Source - Management estimate

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BATTERY WASTE MARKET STRUCTURE

Brought to you by SOIC
Topic: Waste Recycling

CUSTOMIZED AND VALUE ADDED PRODUCTS

GRAVITA
We recycle to save environment


Customized Lead Alloys


Lead Sheets


Lead Bricks


Red Lead


Lead Oxide

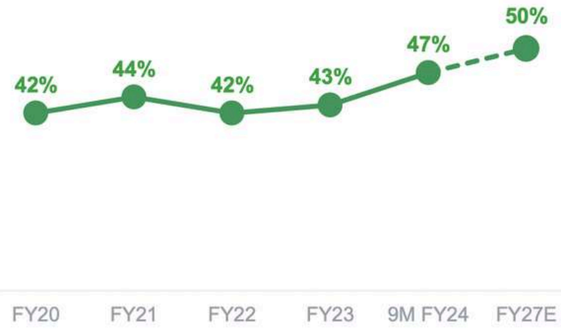

Customized Aluminium Alloys


Plastic Granules


Pet Flakes - Food grade

Our Capability to produce customized and value added products for diversified customer segments gives us better contributions and larger pie of customer's product mix.

Value Added Products % in revenue



Scrap collection – Spread across four continents with LAB being the key source

GRAV has its sourcing network spread across four continents – Asia, Africa, Europe and Americas. As of FY2023, the company has 26/5 self-owned yards and 450+/1,000+ touch points in Africa/Asia (mainly India). It also had 90+ touch points across Europe and the Americas.

Given that nearly 80% of GRAV capacities and volumes for a given year are lead, the most important source of scrap for the company is used LABs. In domestic markets, used batteries are sourced from large corporate clients with battery requirements such as telecom players, corporate offices as well as through Battery OEMs.

Lead scrap, aluminum scrap and plastic scrap is also sourced from overseas markets, which primarily includes Africa, but also includes Europe and Americas. For aluminum, in particular, the company is heavily reliant on overseas scrap due to the lack of domestic metal scrap. The attractiveness of African markets for procurement stems from a thriving second-hand market in automotive vehicles in the region. Given the relatively nascent stage of development of the African nations, organized competition for scrap in these geographies seems fairly limited. Based on management estimates, GRAV has 50%+ market share in all African countries where it has operations.

Battery OEMs provide used LABs to players such as GRAV, which are then processed, and the lead alloys are sold back to battery OEMs such as Amara Raja and HBL Power Systems through a tolling arrangement. Margins for the tolling arrangement are fairly low but the return ratios for recycling players are attractive, given: 1) lower procurement cost due to domestic sourcing and limited requirement to cultivate a procurement network 2) lower working capital requirements as the scrap stays on the books of OEMs (refer exhibit 29).

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BATTERY WASTE MARKET STRUCTURE

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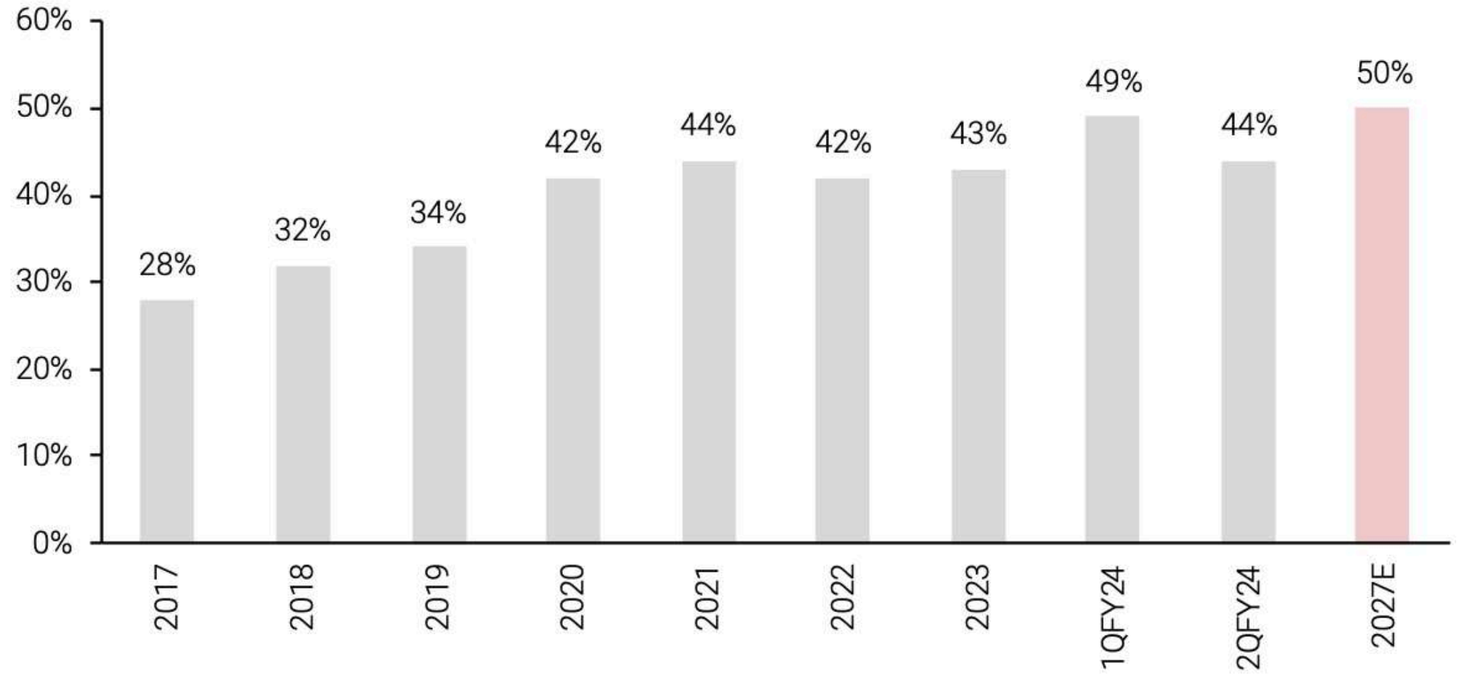
BATTERY WASTE MANAGEMENT RULES 2022

Management targets 50%+ VAP revenue share on expanded capacity base by FY2027E

Exhibit 58: VAP as proportion of total revenues, March fiscal year ends, 2017-23, 27E (%)



Source: Management estimates, Kotak Institutional Equities estimates

NILE Limited

NILE Limited (NILE) established its non-ferrous division for the secondary manufacture of lead and lead alloys from used batteries and other lead scrap in 1999. It has two secondary lead recycling plants in South India: Choutuppal, Telangana (32 ktpa) and Tirupati, Andhra Pradesh (75 ktpa) and a 2MW windfarm in Ananthpur, Andhra Pradesh.

Total volumes for FY2022/23 stood at 61.2/63.6 kt. Almost all revenues pertain to the lead division, with typical EBITDA margins in the range of 3.5-5%.

Customer concentration

NILE's top-2 customers account for almost 100% of total sales as per India ratings credit report on the company. Amara Raja Batteries Limited (ARBL) and ARBL's group company Mangal Industries (MI) contribute almost all revenues for NILE. ARBL's share in NILE revenues stands at 90%/91% for FY2022/23, with the balance being contributed by MI. This exposes NILE to a very high degree of customer concentration risk, partially offset by the industry leading position of ARBL.

Nile has a yearly rolling contract with ARBL, which provides the estimates of its requirement of lead alloys. The pricing mechanism with ARBL is based on monthly average LME prices, plus a premium. Further, ARBL confirms this requirement on a monthly basis two months in advance so that the Nile can plan the purchases of raw materials accordingly. The proximity of NILE's Tirupati plant to the ARBL plant enables it to reduce logistics related costs and lead time.

As per Annual Report for FY2023, ARBL is in the process of setting up their own lead smelter, which is expected to be operational sometime during FY2024. This will affect the total volume offtake, and NILE is actively looking at alternate customers for sale of lead and lead alloys.

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BATTERY WASTE MARKET STRUCTURE

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4

Company profiles: Key Indian metal recycling companies

Pondy Oxides and Chemicals Limited (POCL)

Pondy Oxides and Chemicals Limited (POCL) is primarily engaged in the manufacture of secondary lead and lead alloys, which are supplied to end-users, including manufacturers of lead acid batteries. Its production facilities are located in Sriperumbudur, Tamil Nadu, which is close to the Chennai port and Chittoor, Andhra Pradesh, which is close to Amara Raja's plant. Current manufacturing capacities are mainly for lead, and for certain newer capacities, following its foray into aluminum, copper and plastics. Recently, the company has acquired land in Mundra, Gujarat, and signed an MOU with the Tamil Nadu government for investment in recycling capacities. POCL has raised Rs500/206 mn equity in 4QFY24 to aid growth capex.

Exhibit 47: Manufacturing capacities of POCL as of FY2023

Capacity type	Metric tons per annum (TPA)
Total scrap recycling capacity (Lead)	120,000
Total scrap recycling capacity (Aluminium)	14,750
Total scrap recycling capacity (Copper)	30,000
Total scrap recycling capacity (plastics)	9,000

Source: Company, Kotak Institutional Equities

Lead division

Lead is the primary segment for POCL which contributes 90%+ of total revenues. Lead sales for FY2023 stood at 69.9 kt. According to management, there are certain smelting bottlenecks in secondary lead manufacturing, limiting current output at ~85 ktpa and constraining higher utilization. Utilization levels basis current capacities suggest ~82% capacity utilization. The company's guidance suggests the expansion of lead capacity to 200 ktpa in the next two years, including debottlenecking and growth capex.

Margins for the lead business have been fairly consistent in the 5-7% range over most years, except for FY2020-21, which was impacted by capacity expansions (and less than optimum utilizations) and price volatility. The company has value-added products (VAP) share of ~45-50% in lead, which is further expected to improve incrementally towards 70-75% in the next two years. VAP usually leads to better margins in the range of 150-200 bps for secondary lead manufacturers.

The company has an extensive sourcing network from 90+ countries with 270+ suppliers. Exports mix for FY2021/22/23 stood at 50%/54%/57%. It is empaneled with OEMs, and enters into back-to-back contracts for the sale of lead. While the domestic growth in lead acid batteries (LAB) is expected to be in the single-digits in the next decade, POCL expects double-digit growth in its lead division on account of the shift from unorganized to organized sector on the back of regulatory tailwinds such as GST and BWMR.

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BATTERY WASTE MARKET STRUCTURE

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Topic: Waste Recycling

BATTERY WASTE MANAGEMENT RULES 2022

GRAVITA
We recycle to save environment

VISION 2027

New recycling Verticals
Lithium, Steel & Paper

25% +
Revenue CAGR

35% +
Profitability Growth

25%+
ROCE

50%+
Value added products

25%+
Non-Lead business

Our Priorities

- Shareholder value creation
- Return accretive growth
- Judicious use of capital

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BATTERY WASTE MARKET STRUCTURE

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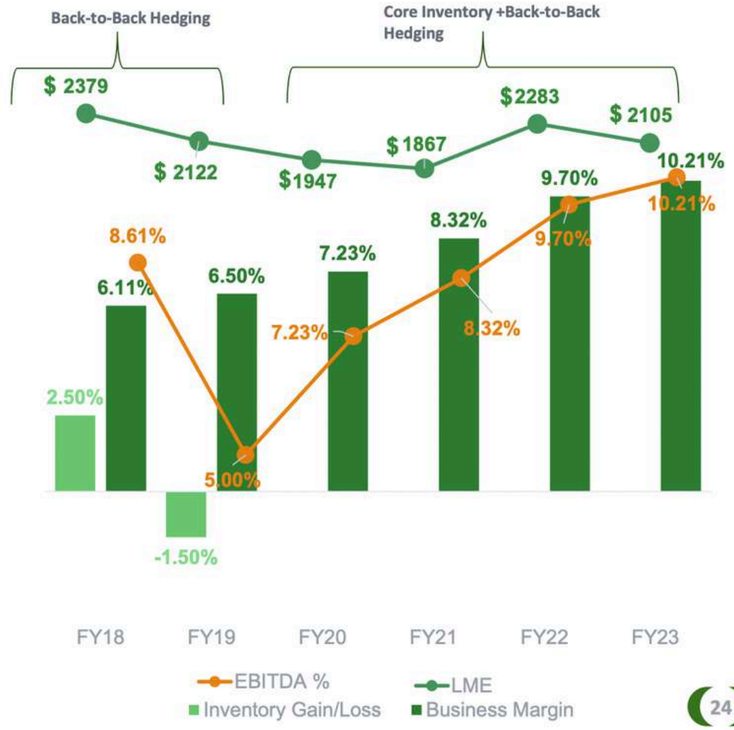
Risk Mitigation by **BACK TO BACK HEDGING** mechanism

GRAVITA
We recycle to save environment

- To mitigate the risk of commodity prices fluctuation from June. 2016
  - Metal equivalent of the scrap bought, is sold on the same day
    - Pricing against Customer contracts – Natural Hedging
    - Forward Contracts on LME Exchange for balance quantity - till final sale to customer
    - Core inventory was not part of back to back hedging

- Gravita started **hedging of core inventory** also in June, 2019 by taking a forward contact on LME Exchange.

- June, 2019 onwards Gravita is enjoys stable margins and is not affected by the commodity price fluctuations



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RECYCLING OF DIFFERENT COMMODITIES

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Topic: Waste Recycling

BATTERY WASTE MANAGEMENT RULES 2022

- Honourable Prime Minister Shri Narendra Modi has highlighted the nation's focus on circular economy in his address at a post-budget webinar on March 4, 2022. On these lines, the Ministry of Environment, Forest and Climate Change (MOEFCC) launched the Battery Waste Management Rules, 2022 (BWMR, or 'Rules') on August 24, 2022.

- The rules focus on encouraging recycling of spent batteries by mandating Extended Producer Responsibility (EPR) and are applicable to multiple battery technologies.

- The Indian recycling industry is yet to achieve maturity and is dominated by unorganized players, leading to substantially lower recycling rates compared to the West. Government policies are gradually addressing these challenges.

- Recycling rate in India (~20%) is significantly lower than the West (60-80%) due to a large informal sector, the lack of a policy framework and inadequate collection infrastructure.

- The BWMR imposes Extended Producer Responsibility (EPR) on battery producers, holding them accountable for the collection, recycling and use of recycled materials in new batteries.

- This should significantly increase lead scrap availability for organized players and shrink the unorganized sector over the next 3-5 years.

- Extended Producer Responsibility (EPR) was added to the draft rules to address the need for recycling of batteries across portable, automotive, industrial, and electric vehicle battery industries.

- EPR mandates manufacturers and producers to be accountable for the collection, storage, transportation, recycling, and disposal of spent batteries.

RECYCLING OF DIFFERENT COMMODITIES

Brought to you by SOIC
Topic: Waste Recycling

BATTERY WASTE MANAGEMENT RULES 2022

LEAD

BWMR and EPR on lead-acid batteries (LAB) should increase scrap availability and shrink the unorganised sector to 25% by FY2028E from 65% market share currently.

ALUMINUM

Scrap is largely imported where secondary aluminum has different end-uses and demand has been outperforming primary aluminum.

EV BATTERY

EV battery recycling is on the cusp of taking off. A few recycling units are being set up in India; however, a wide variety of battery chemistries/black mass is a key challenge.

RECYCLING OF DIFFERENT COMMODITIES

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BATTERY WASTE MANAGEMENT RULES 2022

- Lead: BWMR and EPR on lead-acid batteries (LAB) should increase scrap availability and shrink the unorganized sector to 25% by FY2028E from 65% market share currently.
- Aluminum: Scrap is largely imported where secondary aluminum has different end-uses and demand has been outperforming primary aluminum.
- EV Battery: EV battery recycling is on the cusp of taking off. A few recycling units are being set up in India; however, a wide variety of battery chemistries/black mass is a key challenge.
- Plastics: Plastic Waste Management Rules 2022 (PWM), notified in 2022, is a major step toward increasing recycling but the enforcement ecosystem is still evolving.
-
- E-Waste: Scrap availability is increasing at a rapid pace, but a lack of technology and the presence of hazardous materials are key hurdles restricting growth.
-

RECYCLING OF DIFFERENT COMMODITIES

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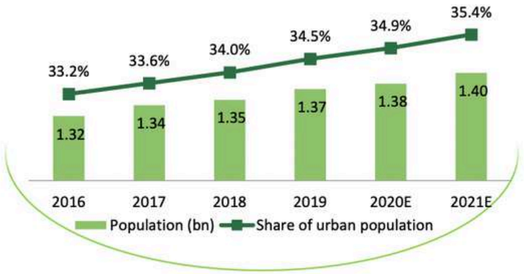
Topic: Waste Recycling

WASTE MANAGEMENT INDUSTRY TREND

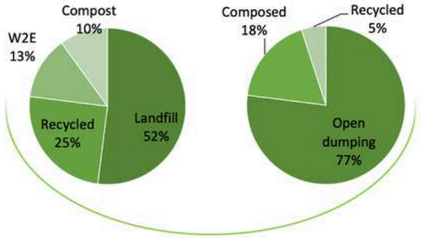
Estimated Waste Management Industry (FY20)

Global	Indian
Rs. 23,000 Billion	Rs. 50 Billion

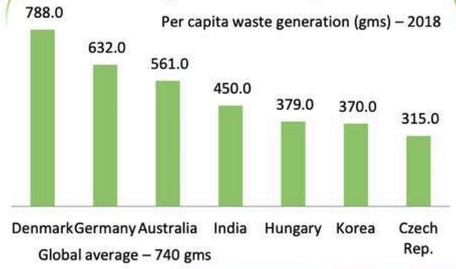
Increasing population with higher urbanization would drive higher per capita waste generation in India



India practices a much higher level of open dumping v/s global average

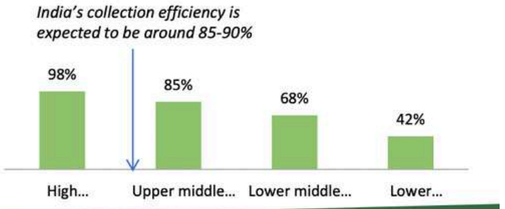


India per capita waste generation lags world average



MSWM industry in India is expected to ~double over next 5 years

Waste collection efficiency by Countries' income levels



RECYCLING OF DIFFERENT COMMODITIES

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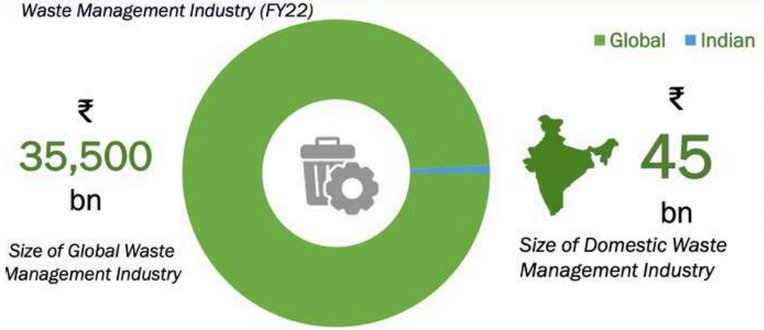
Topic: Waste Recycling

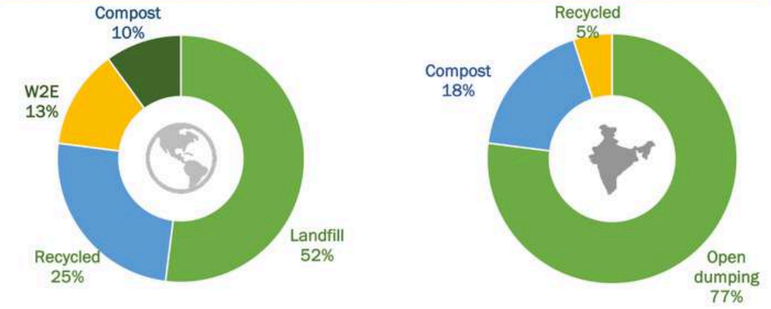
WASTE MANAGEMENT INDUSTRY TREND

India's Waste Management Industry has enormous growth potential

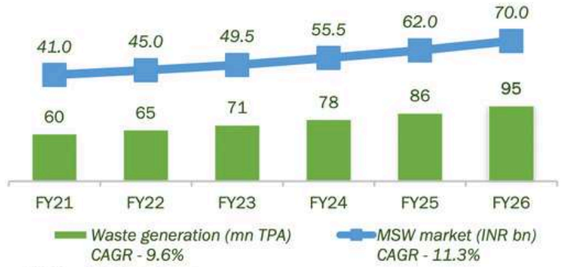
Waste Management Industry (FY22)



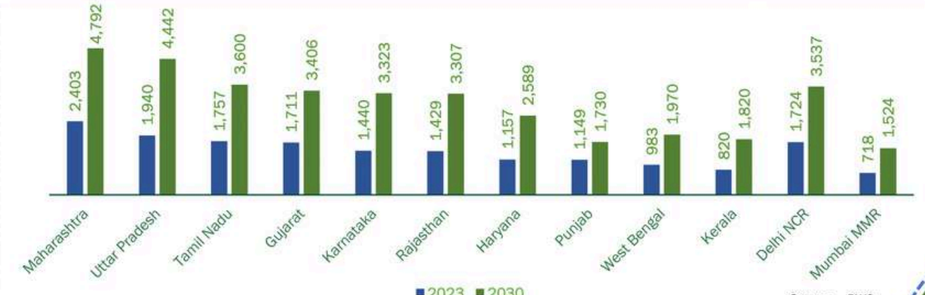
On average India practices higher open dumping vs global average



MSWM is expected to double in India in the next 5 yrs



Geography wise Vehicle Scrapping Market by size (₹ in Cr.)



Source – DNA Consult - Industry Reports
Note: Maps not to scale. All data, information, and maps are provided "as is" without warranty or any representation of accuracy, timeliness or completeness

Source – PWC

Sustainability with growth .....

RECYCLING OF DIFFERENT COMMODITIES

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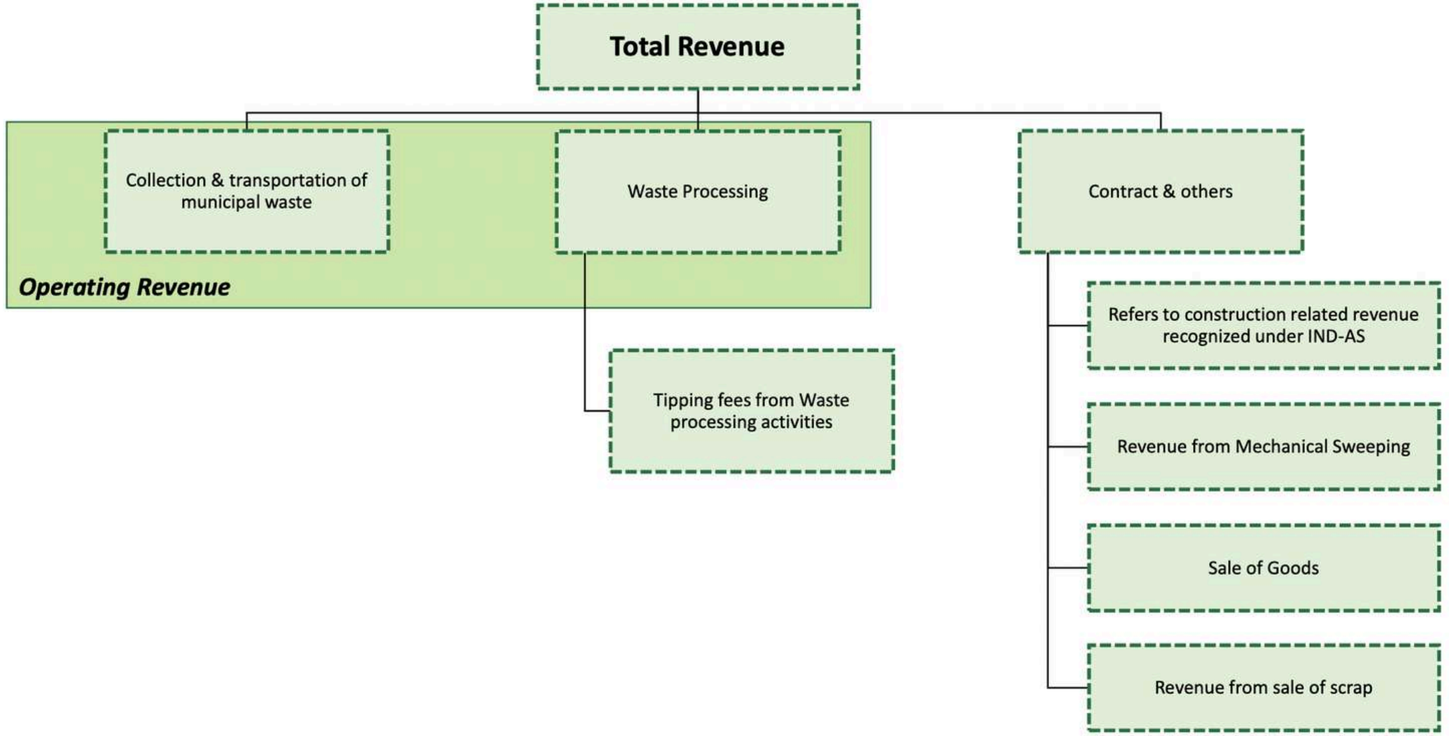
Topic: Waste Recycling

WASTE MANAGEMENT INDUSTRY TREND



RECYCLING OF DIFFERENT COMMODITIES

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Topic: Waste Recycling

WASTE MANAGEMENT INDUSTRY TREND

MSW C&T

58% Revenue Contribution

- Door to door collection through primary collection vehicles
- Transportation of waste to processing facility, transfer station or a landfill disposal site
- Revenue calculation based on No. of trips/ Per tons/ Fixed per day
- Escalation based on flat rate/ inflation/ formulas
- Currently 12 on-going contracts
- Average on-going contract duration is 7.7 years

MSW Processing

29% Revenue Contribution

- Processing projects involve sorting & segregating waste received from MSW C&T, followed by composting, recycling, shredding and compressing into RDF
- Revenue calculation based on Per hectre/ Km/ hour
- Escalation based on flat rate/ inflation
- Currently 2 on-going contracts
- Average on-going contract duration is 23 years

Contract & Others

13% Revenue Contribution

- Integrated mechanical and manual sweeping of streets, sale of goods, Revenue from sale of scrap
- Contract revenue arising from IND-AS treatment for capital expenditure incurred at DBOOT projects along with mechanical etc..
- Revenue calculation based on Per hectre/ Km/ hour
- Escalation based on flat rate/ inflation
- Currently 2 DBOOT projects and 4 Mechanical Sweeping projects

Limited project & counter-party credit risk

User Fees
Reducing collections risk through user fee collection from designated persons in NOIDA project

Study of financial viability of rewarding authority
Focus on municipal corporations with strong financials/ credit ratings

Detailed viability analysis of the project
- Rational bidding after background research
- Focus on contracts with pass-through escalations for major costs

RECYCLING OF DIFFERENT COMMODITIES

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Topic: Waste Recycling

WASTE MANAGEMENT INDUSTRY TREND

Not Just a Solid Waste Collecting Company but also a Waste Processing & Management Company....

Door to door collection	*Transportation*	*Segregation*	*Construction & Management of Landfills*	*Recycling*	*Composting*	*Waste to Energy*
Involves door to door collection of MSW from households, slums, commercial establishments etc. by vehicles like compactors, dumper placers and tippers	Strong C&T capabilities with a large fleet of vehicles Transported to the processing facility, transfer station or a landfill	Segregation involves separation of organic waste from recyclables and inert material	Manages largest bio-reactor landfill, manages 5,000 TPD waste at Kanjurmarg facility through MRF, Bio-reactor landfill & sanitary landfill operations	Processes waste materials into new materials and objects	Organic material is processed to produce compost	Recyclables produce RDF which is used in cement kilns & other facilities as fuel/ for power generation

...with end-to-end capabilities

- **Collection & Transportation** - Revenues as a 'Tipping fees' from Municipal Corporation/ User fee fixed fee per tonne/trip/area
- **Waste Processing -** Revenues as a 'Tipping Fee' for processing waste per tonne and from sale of recyclables/RDF/Electricity

RECYCLING OF DIFFERENT COMMODITIES

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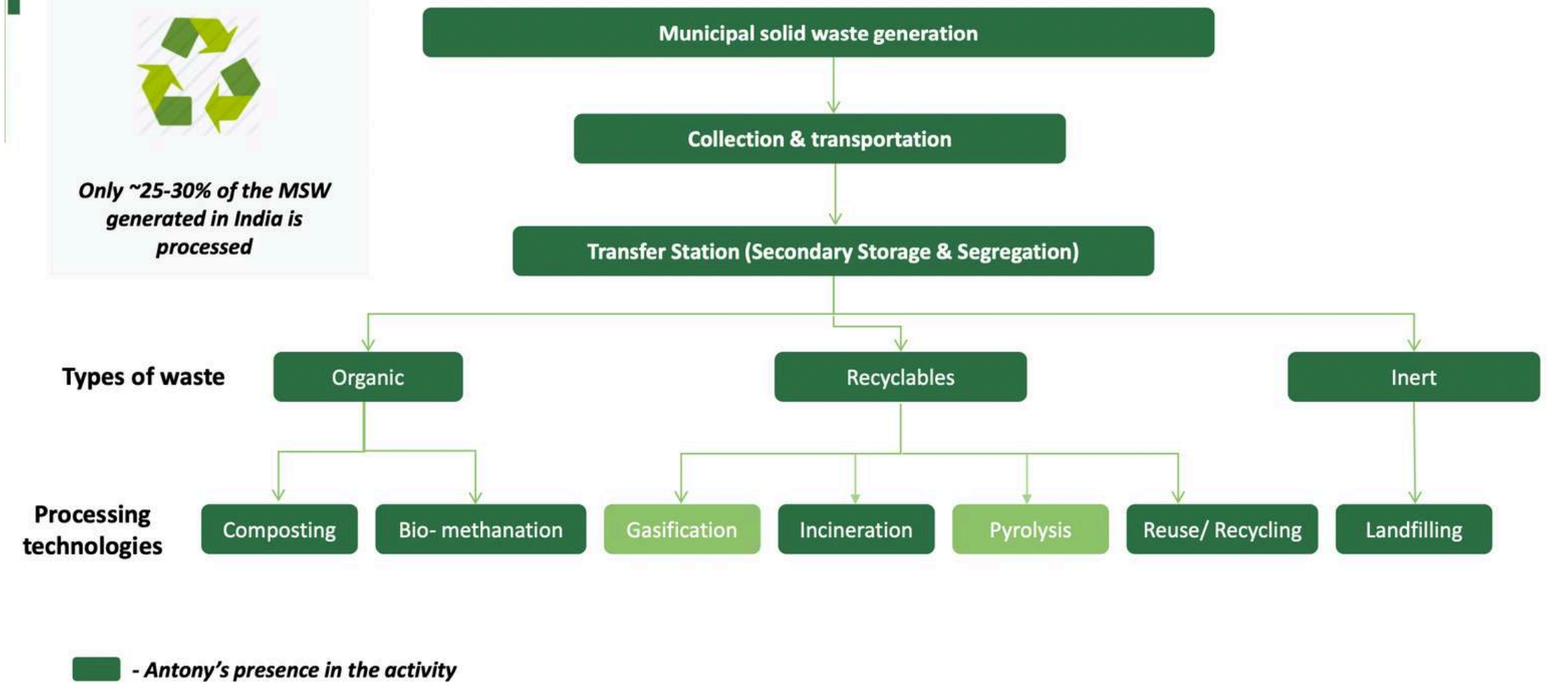
WASTE MANAGEMENT INDUSTRY TREND

Only ~25-30% of the MSW generated in India is processed



- Antony's presence in the activity

RECYCLING OF DIFFERENT COMMODITIES

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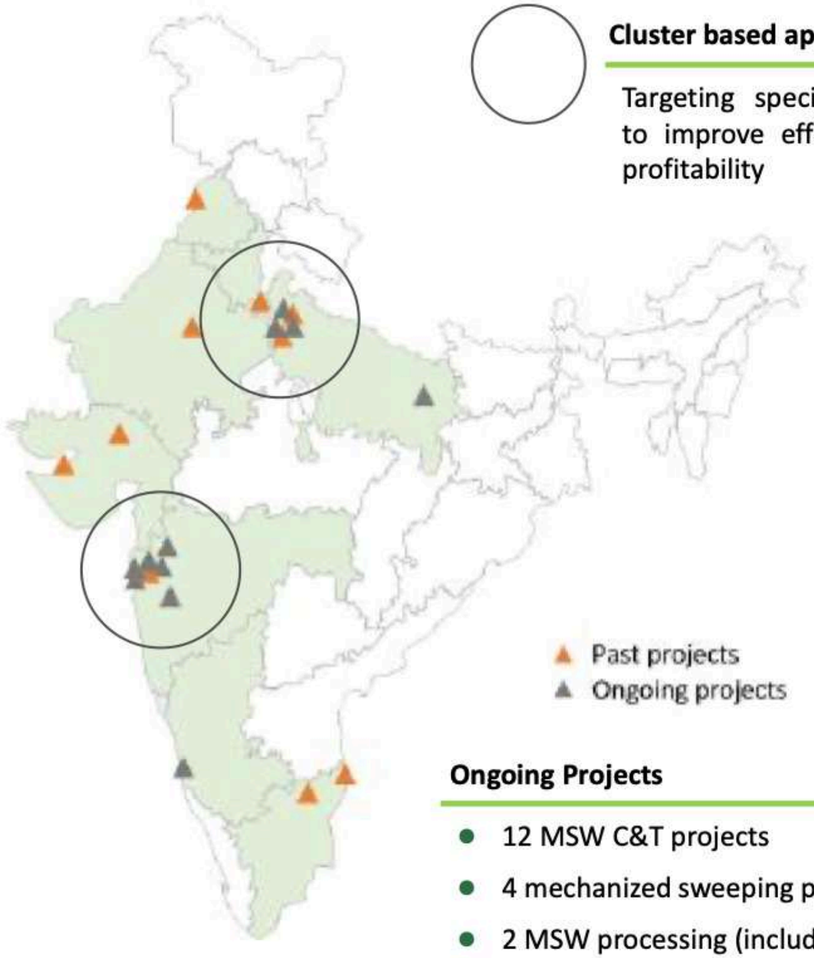
WASTE MANAGEMENT INDUSTRY TREND

Pan India Footprint of Projects



Cluster based approach

Targeting specific clusters to improve efficiency and profitability

Ongoing Projects

- 12 MSW C&T projects
- 4 mechanized sweeping projects
- 2 MSW processing (including WTE) projects

RECYCLING OF DIFFERENT COMMODITIES

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WASTE MANAGEMENT INDUSTRY TREND

One of the largest single location plant* in Asia

We operate one of the largest single location waste processing plants in Asia

2010-2036
Project Tenure

~16 Years
Balance Tenure

बृहन्मुंबई महानगरपालिका
Municipal Corporation of Greater Mumbai
Customer

Year wise probable increase in Tonnage

Capacity

- Bio-reactor Landfill with a capacity of ***6,500 TPD***
- Sanitary Landfill of ***250 TPD***
- Material Recovery & Composting Facility ***(capacity of 1,000 TPD)***
- Gas to Energy plant – ***0.97 MW***

~5,000 Tonnes
Of waste per day handled currently

Rs. 3/unit
Plans to sell surplus electricity to BMC in future

Project scope
Design, Construction, operation and maintenance of integrated waste management facilities on DBOOT basis

~60%
Of waste generated in Mumbai is handled at Kanjurmarg site

1 mmt
Waste processed in FY20

Kanjurmarg site currently handling ~5,000 TPD of MSW; Capable of handling ~7,500 TPD
Only plant in India to produce refuse-derived fuel ("RDF") with a calorific value of over 3,000 Kcal/kg*
Doubling of production capacity reflected in Compost sale rising by 128% to 6,436 mt in 9M FY21

*Source: report titled "India Solid Waste Management Overview" dated September 22, 2020, issued by Frost & Sullivan (India) Private Limited ("FS Report")| (7) New Delhi (1-10 lakh population category), Navi Mumbai (>10 lakh population category) | ^Annualized | ^^Calculated from Restated financials

RECYCLING OF DIFFERENT COMMODITIES

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Topic: Waste Recycling

WASTE MANAGEMENT INDUSTRY TREND

Collection and Transportation Technological Intervention


Small Tipper - **689**


Compactor - **281**


Dumper Placer - **31**


Power Sweeping Machine - **8**


Big Tipper - **86**


Hook Loader - **21**


Drain Stilt Machine & Others - **31**

969 Out of 1,147 vehicles** fitted with **GPS tracking devices

GPS allows movement tracking to optimize route & achieve higher vehicle utilization

Vehicles & Equipment's procured from leading international suppliers including the likes of Compost Systems GMBH

Key equipment vendors

PUCHER
HYVA
KARCHER
HEIL
CHICAGO PNEUMATIC
CATERPILLAR
MOBA
(GPS TECHNOLOGY PROVIDER)

Waste processing technology

Experienced JV Partner for the scientific landfill at Kanjurmarg

LARA
CENTRAL DE TRATAMENTO DE RESÍDUOS LTDA.

Key Processes

- Aerobic process using material recovery facility and composting facility at Kanjurmarg Plant
- Anaerobic process using Bioreactor landfill technology at Kanjurmarg Plant

RECYCLING OF DIFFERENT COMMODITIES

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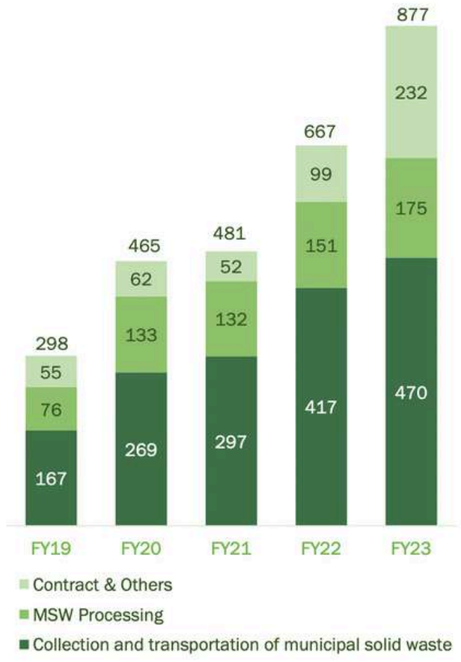
WASTE MANAGEMENT INDUSTRY TREND

Consolidated Financial Highlights

ANTONY WASTE

Revenue (Rs. in Cr)

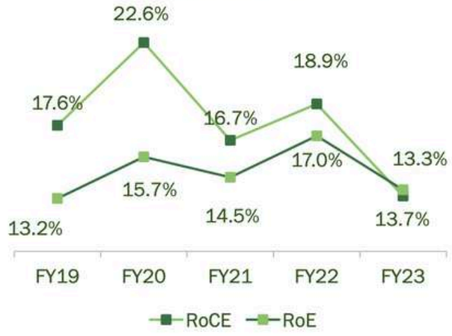


Includes provisions of Rs. 24.4 crores in FY23, Rs. 6.8 crores in FY22

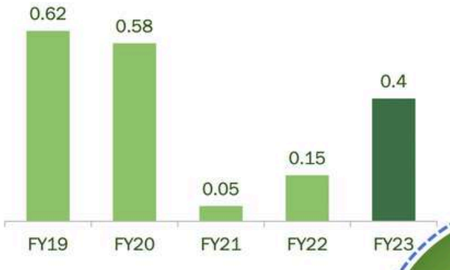
EBITDA (Rs. in Cr) & EBITDA Margin (%)

PBT before exceptional item (Rs. in Cr) & PBT Margin (%)

ROCE & ROE (%)



Net Debt / Equity (x)



Sustainability with growth ……..

RECYCLING OF DIFFERENT COMMODITIES

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Topic: Waste Recycling

Experience in Project Execution Across the Country

ANTONY WASTE

Particulars	Type of Services			
	MSW C&T	Mechanized Sweeping	MSW Processing	Construction & Demolition
Thane Municipal Corporation	✓			
Navi Mumbai Municipal Corporation	✓	✓		
Mangaluru Municipal Corporation – North and South Zone	✓			
Greater Noida Industrial Development Authority – Zone 1	✓			
Jaypee International Sports (JIS)	✓			
Brihanmumbai Municipal Corporation– Borivali & Dahisar	✓			
Brihanmumbai Municipal Corporation – Slice B				✓
Pimpri-Chinchwad Municipal Corporation – South Zone	✓	✓		
Nagpur Municipal Corporation – Zone 1 to Zone 5	✓	✓		
New Okhla Industrial Development Authority	✓			
Greater Noida Industrial Development Authority – Part I and Part III		✓		
Brihanmumbai Municipal Corporation - Kanjur Project			✓	
Pimpri-Chinchwad Municipal Corporation - Waste to Energy Project			✓	
Varanasi Municipal Corporation	✓	✓		
Jhansi Smart City Limited	✓			
Greater Noida Industrial Development Authority (GNIDA) – Biomining project			✓	
North Delhi Municipal Corporation - Sadar Paharganj Zone	✓			
Nashik Municipal Corporation – Satpur and Panchvati	✓			
Panvel Municipal Corporation	✓			

26
Ongoing projects

9
States
(Projects executed till date)

Sustainability with growth .....

RECYCLING OF DIFFERENT COMMODITIES

Brought to you by SOIC
Topic: Waste Recycling

WASTE MANAGEMENT INDUSTRY TREND

Exhibit 29: MSWM competitive service mapping

Player	Collection &Transportation	Treatment & Disposal	Landfills
Ramky Enviro Engineers	√	√	√
Antony Waste	**√**	**√**	**√**
Metro Waste Handling pvt Ltd	√	√	
BVG	√	√	√
A2Z	√	√	
SPML Infra	√	√	
Terra Firma	√	√	
Essel Group	√	√	

Source: MNCL, Company

RECYCLING OF DIFFERENT COMMODITIES

Brought to you by SOIC
Topic: Waste Recycling

WASTE MANAGEMENT INDUSTRY TREND

End-to-end waste management capabilities...

ANTONY WASTE

1. **Door to door collection** — *Involves door to door collection of MSW from households, commercial establishments etc.*
2. **Transportation** — *Strong C&T capabilities with a large fleet of vehicles. Waste is transported to the processing facility, transfer station or a landfill*
3. **Segregation** — *Segregation involves separation of organic waste from recyclables and inert material*
4. **Construction & Management of Landfills** — *Manages largest bio-reactor landfill. Handles ~5,800 TPD waste at Kanjurmarg facility through MRF, bio-reactor landfill & sanitary landfill operations*
5. **Recycling** — *Recyclables are segregated and sold to downward recyclers for further processing*
6. **Composting** — *Organic material is processed to produce compost*
7. **Waste to Energy** — *Handles ~700 TPD waste at PCMC facility generating 8 MW to 14 MW power using mixed MSW*

Sustainability with growth ……..

Bhavya Gandhi: Right, okay fair enough. And if you can throw some light, I know it's very early right now, but if you can throw some light, what would be the entire process of collecting construction debris, the corporation will tell you collect the debris from a particular building or how is it like, if you can just explain the entire roadmap how the process will be done on ground level?

Mahendra Ananthula: So, as per the tender we are supposed to collect waste from Western suburbs of Mumbai. So, that's the area of jurisdiction that we have in our scope. And then there are two types of segments, two type of customers, I would say one are the builders, builders who are taking up redevelopment projects and are likely to generate a lot of debris. So, they are the people who are mandated to supply the waste to us, which we will carry and process at our site. The second would more at the ward level or at the sector level, wherein people generating lesser quantity of construction debris, but they would like to keep it outside their building or a small building or something like that. So, you can say maybe some large builders, and individual household owners who generate these two. So, that's how the tender has specified these two types of customers.

Arpit Shah: Rs.12 Crores to Rs.13 Crores is on a quarterly rate or a monthly rate?

N G Subramanian: On a quarterly rate.

Arpit Shah: Which includes tipping fees plus sale of power?

N G Subramanian: Yes.

Arpit Shah: What kind of margins you will be making on this business because it is typically high margin business right?

N G Subramanian: Yes it is normally a very high margin business so this is like any processing contract will be around 40% to 45% kind of an EBITDA kind of number. It can even be better depending upon the auxiliary power consumption stats and other things so that is why the Q4 would be the first quarter where we have the basic numbers about what kind of rated capacity, the auxiliary consumption, the kind of LDOs that we need to use for startups and shutdowns all will come into play.

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DIFFERENT TYPES OF PLASTIC?

Brought to you by SOIC
Topic: Waste Recycling

DIFFERENT TYPES OF PLASTIC

1 PET	02 PE-HD	03 PVC	04 PE-LD	05 PP	06 PS	07 O
Polyethylene terephthalate	Polyethylene (high density)	Polyvinyl chloride	Polyethylene (low density)	Polypropylene	Polystyrene	Bisphenol A and others
PET is commonly used in commercially sold water bottles, soft drink bottles, sports drink bottles, and condiment bottles.	HDPE is commonly used in milk and juice bottles, detergent bottles, shampoo bottles, grocery bags, and cereal box liners.	PVC can be flexible or rigid, and is used for plumbing pipes, clear food packaging, shrink wrap, plastic children's toys, tablecloths, vinyl flooring, children's play mats, and blister packs (such as for medicines).	LDPE is used for dry cleaning bags, bread bags, newspaper bags, produce bags, and garbage bags, as well as "paper" milk cartons and hot/cold beverage cups.	PP is used to make yogurt containers, deli food containers, furniture, luggage and winter clothing insulation.	PS, also popularly known as Styrofoam, is used for cups, plates, take-out containers, supermarket meat trays, and packing peanuts.	Any plastic item not made from the above six plastics is lumped together as a #7 plastic. things like CD's baby bottles and headlight lens
						

DIFFERENT TYPES OF PLASTIC

Composition of plastic waste

The following table provides an overview of the types of plastic waste generated in India:

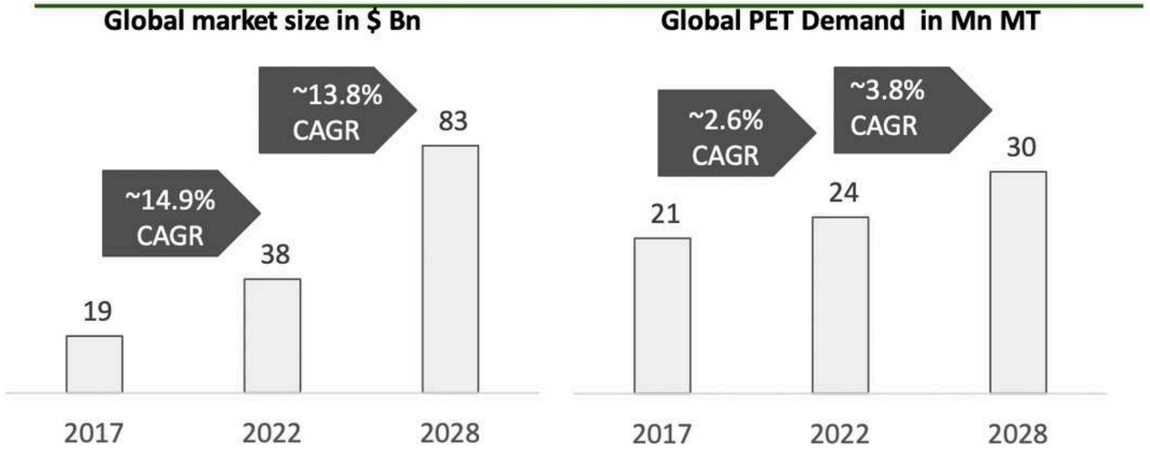
Plastic type	Properties	Recyclability	Select applications	% of total plastic usage
Polyethylene Terephthalate (PET)	/ Lightweight, strong, and transparent / Ability to prevent oxygen from getting in and spoiling the product thus making it ideal for food and drink packaging		Beverage bottles, Food bottles/jars and polyester clothing or ropes	15%
High Density Polyethylene (HDPE)	/ Denser, stronger, thicker, and stable when compared to PET / Resistant to moisture and chemicals		Milk cartons, detergent bottles, cereal box liners, toys, buckets, park benches and rigid pipes	14%
Poly Vinyl Chloride (PVC)	/ Hard, rigid, poor conductor of electricity and resistant to chemicals and weathering, making it suitable for construction & electrical applications / Impermeable to germs which makes it widely used in medical applications		Plumbing pipes, credit cards, human, rain gutters, teething rings, medical tubing and oxygen masks	10%
Low Density Polyethylene (LDPE)	/ Softer, clearer, flexible version of HDPE / Considered as a safer plastic option for food and drink use		Bread bags, bubble wrap, garbage bags, grocery bags and beverage cups	13%
Polypropylene (PP)	/ Most durable form of plastics / More heat resistant and stiffer than other plastics, making it ideal for food packaging and food storage for hot items		Straws, bottle caps, prescription bottles, hot food containers, packaging tape, disposable diapers and DVD/CD boxes and chairs	38%
Polystyrene (PS)	/ Rigid plastic has better insulating properties / Used as a staple in the food, packaging, and construction industries		Containers, shipping and product packaging, egg cartons, cutlery and building insulation	2%
Others	/ Variety of plastic materials like Multilayer & Laminated Plastics, PUF, Bakelite, Polycarbonate, Melamine, etc. used in multiple applications		Eyeglasses, baby and sports bottles, electronics, CD/DVDs, lighting fixtures and clear plastic cutlery	8%

India is a leader in recycling some specific types of plastic such as PET, with an estimated recycling rate of around 90%.

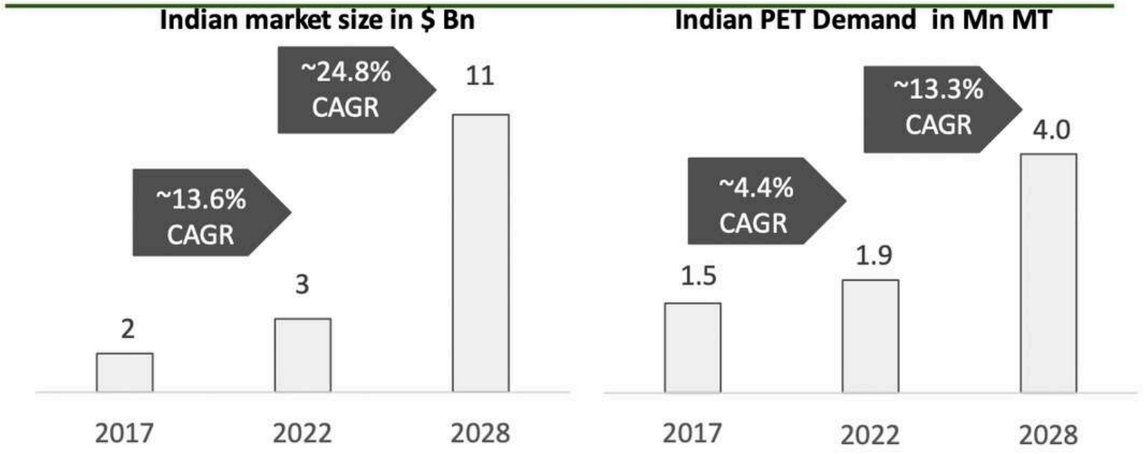
Very Commonly recycled | Commonly recycled | Sometimes recycled | Typically not recycled

ENTIRE VALUE CHAIN OF PLASTIC RECYLCING

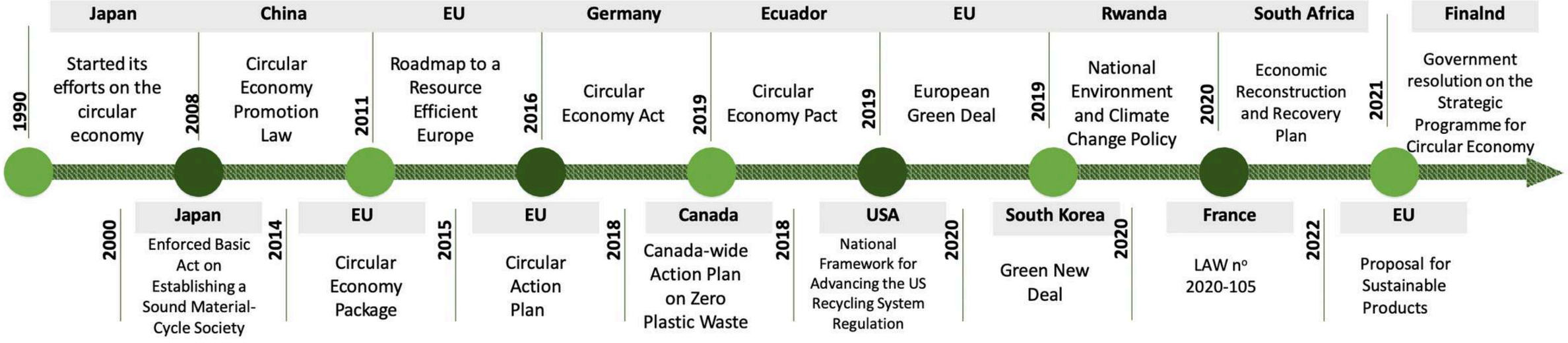
Global PET market poised to grow



Followed by strong growth potential in the Indian market



Increasing focus of countries towards circular economy to potentially drive the growth of recycled PET market



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DIFFERENT TYPES OF PLASTC?

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Topic: Waste Recycling

VALUE CHAIN

Government Regulations

Recent government regulations of mandating to use at least 30% recycled content in new PET bottles from 2025.

To capitalise on this opening, a new manufacturing facility in Warangal (South India) is being commissioned.

Extended Producer Responsibility (EPR)

To capitalize on this opportunity and fulfil EPR liability, the company is setting up a plant in Kanpur.

The capacity of this pilot plant is 300 tons per month.

Estimated project cost is around Rs. 30 crores.

Post successful implementation, they'll ramp up the capacity to 1,000 tons per month.

VALUE CHAIN

(in thousand tonnes p.a.)	2025	2026	2027	2028	2029	2030
PET resin consumption (India)	1370	1453	1542	1637	1737	1843
Bottle grade application consumption (%)	94%	94%	94%	94%	94%	94%
Packaging application consumption	1287	1366	1450	1539	1633	1733
Mandatory recyclability content (%)	30%	40%	50%	60%	60%	60%
Expected rPET consumption - Packaging	**386**	**547**	**725**	**923**	**980**	**1040**
Ganesha's Market opportunity Size (assuming 20% market share)	**77.2**	**109.4**	**145**	**185**	**196**	**208**

ENTIRE VALUE CHAIN OF PLASTIC RECYLCING

Value chain

PET Bottle Collection → Sorting → Washing → Shredding & Cleaning → Conversion of Flakes to Resin → Storing → Transporting to End-user Industries

Used Pet Bottle Collection

Post Consumer PET Bottles sent to recycling facility

Recycling Facility

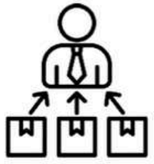
Recycling facilities crush these bottles to flakes

rPET Flakes

rPET flakes converted to pellets/resins which are supplied to end user industries

End User Industries

Domain expertise

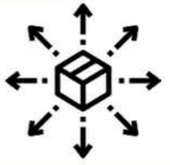


Strong relationships with vendors

Strong relations and collection network of **250+ suppliers** across India based on which the company mobilizes ~350 tons of PET waste every day

Process expertise

The manufacturing facility **has fine tuned processes** to eliminate PET flakes which are not standard and thus ensuring quality control over end products



Distribution

Company has **6 sales office** across the expanse of India and has a reach to **400+ clients** in India as well as Globally to **20+ countries**

Creating the ecosystem of waste collection

Ganesha has created a strong ecosystem of organized vendors on a Pan India basis to collect plastic waste

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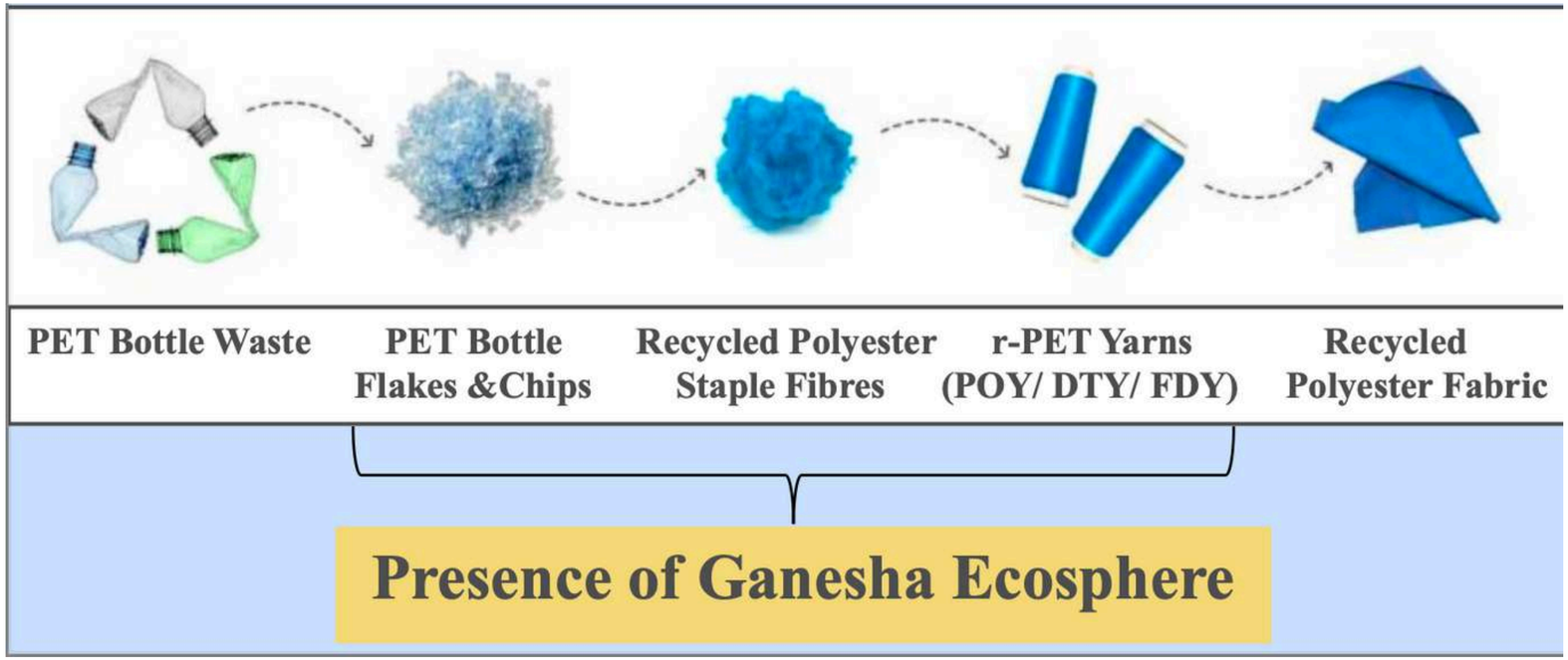
Topic: Waste Recycling

VALUE CHAIN



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VALUE CHAIN

1. Recycled Polyester Staple Fibre

- Installed Capacity – 96,600 tonnes
- There are around 35-40 manufacturers using recycled PET as raw material converting it RPSF
- In the entire value chain: RPSF is the lowest margin product
- Approximate realization per tonne is Rs. 95/kg
- Commodity Product
- But, still the company has been able to maintain margins over the years

(in INR Crores)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Revenue	435	499	623	647	674	753	1,020	889	751	1,021
EBITDA	48	55	63	74	79	87	133	112	85	116
EBITDA Margins	11%	11%	10%	11%	12%	12%	13%	13%	11%	11%

Stable Margins since past 10 years

- RPSF **Expansion**: 25,000 tonnes

2. Recycled Polyester Spun Yarn and Filament Yarn

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DIFFERENT TYPES OF PLASTC?

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VALUE CHAIN

2. Recycled Polyester Spun Yarn and Filament Yarn

JAINAM
Prosperity with Security

Current – 18% revenue is derived from yarn

Products-

i. Spun Yarn
ii. Dyed Texturised Yarn (Melange, Single yarn, Doubled Yarn)

Filament Yarn (Expansion)

- Expansion: 14,000 tonnes
- EBITDA Margins ranges between 20-25%
- Only one-two players are manufacturing recycling filament yarn. Hence, there isn't much availability. The company plans to supply filament yarn to Zara / Uniqlo to command premium. Already supplying to Decathalon, Welspun India etc.
- Globally, the premium for recycled yarn compared to virgin is much higher than India
- In India, pricing mechanism is linked to virgin polyester fibre
- The demand for quality recycled products by marquee apparel and lifestyle brands is rising
- Many of these big brands are looking for partners who can supply high quality and sustainable recycled fibers, yarn & fabric. To address this opportunity, the company has introduced the branded and non-commoditised value-added products under the new '**Go Rewise**' brand.

GoRewise

INDITEX NIKE H&M adidas UNIQLO UNDER ARMOUR

NIVESH आय
We nurture your wealth

JAINAM
Prosperity with Security

VALUE CHAIN

Products Realization

	Products	Realisation/kg
Raw Material	Scrap Pet Bottle	45
Ganesha Ecosphere's Products	R-Pet Flakes	65
	R-Pet Chips	100
	RPSF	95
	Recycled Yarn	130

RPSF EBITDA per kg

Rs. 11

Why is it low ?
- Commodity Product

R-PET Chips EBITDA per kg

Rs. 26

Why is it high ?
- Technicalities involved
- High Demand
- Recycle Premium
- High ROI Project

Recycled Filament Yarn EBITDA per kg

Rs. 35

Why is it high ?
- Value Added Product
- Less Competition
- Recycle Premium

NIVESH आय

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DIFFERENT TYPES OF PLASTC?

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VALUE CHAIN

State of the art manufacturing facilities

across 6 plants strategically located across the expanse of India and Nepal

Nepal	**12,000 TPA**
Washed flakes	12,000 TPA

Kanpur	**18,000 TPA**
rPET Fiber	15,000 TPA
Dyed Textured yarn	3,000 TPA
Rudrapur	**39,600 TPA**
rPET Fiber	39,600 TPA
Bilaspur and Temra	**49,200 TPA**
rPET Fiber	42,000 TPA
rPET Spun Yarn	7,200 TPA
Warangal	**49,640 TPA**
rPET Granules	14,000 TPA
B2F Chips/ Filament Yarn	12,240 TPA
RPSF	12,600 TPA
PPSF	10,800 TPA

Capacity represents nameplate capacity

Manufacturing units have best in class certifications having a strong focus on quality

OHSAS 18001:2007 COMPANY · ISO 14001:2004 COMPANY · QUALITY ISO 9001:2008 CERTIFICATION · Global Recycled Standard · OCEAN BOUND PLASTIC CERTIFIED · OEKO-TEX® CONFIDENCE IN TEXTILES STANDARD 100 · Sedex SMETA · SMETA 4-PILLAR CERTIFIED FACTORY

Warangal facility have additional approvals for food grade applications

efsa EUROPEAN FOOD SAFETY AUTHORITY · FDA APPROVED · fssai

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DIFFERENT TYPES OF PLASTC?

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Topic: Waste Recycling

VALUE CHAIN

Why Ganesha Ecosphere Limited?

JAINAM
Prosperity with Security

B. Nepal Unit

- Washing and chip plant
- **Expected Revenue:** Rs. 75 crores
- **Expected EBITDA margins:** 18-20%
- **Capex:** Rs. 40 crores
- Project commenced

C. Kanpur Unit: HDPE pilot plant

- **Capacity:** 300 tons per month
- **Capex:** Rs. 30 crores (funded through insurance claim received)
- **Plans to ramp** upto 1000 tons per annum
- **Expected Revenue:** Rs. 100 crores
- **EBITDA margins guidance:** 20%

Why Nepal?

- Raw material is 15% cheaper
- Tax rate is 12% for first 5 years
- Ample availability of raw material

They plan to start recycling of rigid plastics. The aim is to seize upcoming opportunities for quality products in recycled rigid plastic (HDPE) segment to fulfil the EPR liability of brand owners & manufacturers.

Cumulative expected revenue from the above 3 capex is expected to be around Rs. 750 crores. EBITDA margins is expected to be in the range of 18-20%. Total capex incurred is Rs. 500 crores

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We nurture your wealth

Why Ganesha Ecosphere Limited?

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DIFFERENT TYPES OF PLASTC?

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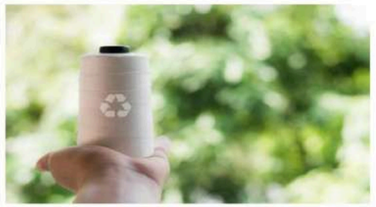
Topic: Waste Recycling

VALUE CHAIN

Launching new products in the space under Rewise

Every product manufactured under the brand goes through stringent quality checks to ensure only highest quality rPET products are supplied to our partners



Product name	rPET Chips – Bottle Grade	rPET Chips – Textile Grade	rPET Fibers & Yarns
Target Customers	Partner with F&B industry for packaging needs	Partner with sustainability focused apparel & textile brands	Partner with sustainability focused apparel & textile brands
Differentiation	Almost virgin like properties	High customization that deliver better than virgin properties	Specialty product basket to cater to niche sectors
Certifications	USFDA, EFSA & FSSAI approved technology for food grade packaging	GRS & Oekotex certified rPET chips for high end textile applications	GRS and Oekotex certified Fibers and Yarns with high consistency and strength

BUSINESS SEGMENTS

Offering a wide product portfolio…

	rPET fibre							rPET spun yarn			
Products	Solid Fibre and dope dyed fibre	Hallow/ Conjugated	Fire retardant	Short-cut fibre	Micro fibre	Trilobal fibre	Polyester staple fibre	Melange	Single yarn	Double yarn	Filament yarn
Applications	Spinning, non woven fabrics	Stuffing in toys, pillows, etc	Industrial fabrics	Blending with other fibers	Fine fabrics	Special effect	Apparel, flooring, packaging, furniture etc	Body warmers	Dress material	Suitings, shirtings, furnishing fabric	Shirts, trousers, suits, home textiles, and bed linen
Industry	Textile and non woven fabrics	Home furnishings	Technical textiles	Textile, paper and construction	Textile		Spinning	Knitting	Clothing, knitting, hosiery, spinning		

Ganesha has developed over 500 + product variants

Giriraj Daga: Yes. Hello, sir. So, actually I am new to the company. So, I will have some of the first clarification while I was going through the presentation. You mentioned that second line of rPET granules will start by June. But when I look at your PPT, slide number 24 of the presentation, you mentioned that rPET granules capacity is 14,000 and I believe that the entire capacity is commissioned, right?

Gopal Agarwal: So, basically there are three production lines we are talking. So, one is already up and operational and for that we have mentioned we are already operating at 86% in Q3. And the second line is under implementation, which is hopefully to be operational by the end of this month. And third line is under dispatch and that is also expected to be operational by June 24. So, overall three production lines are there.

Giriraj Daga: And the combined three will have 14,000 tons.

Gopal Agarwal: 42,000 tons. Combined is 42,000 tons. One line is 14,000 tons.

Giriraj Daga: Okay. So, we have rPET capacity of 42,000 tons.

Gopal Agarwal: Correct.

Giriraj Daga: At Warangal. Yes. And then we also mentioned B2F chip and filament yarn of 12,240, RPSF of 12,600 and PPSF of 10,800. These are the additional capacities?

Gopal Agarwal: Yes, yes. These are the additional -- After the implementation of these two additional rPET lines, the combined capacity would be around 78,000 tons at Warangal plant.

Giriraj Daga: Okay. So, when are the timelines for commissioning of these three lines?

Gopal Agarwal: So, we have already informed that the second line is to be operational by the end of this month. And the third line is expected to be installed and operational by June 24. So, by June 24, our entire capacity of 78,000 tons will be operational.

Giriraj Daga: June 24.

Gopal Agarwal: Okay.

BUSINESS SEGMENTS

Exposure to volatility in finished goods prices

Polyester Staple Fiber (PSF) is a synthetic man-made fibre made directly from Purified Terephthalic Acid (PTA) and Mono Ethylene Glycol (MEG) or Polyethylene Terephthalate (PET Chips), while recycled polyester staple fibre (RPSF) is made from recycled PET Chips, polyester waste, or post-consumer PET bottle flakes. The price of RPSF is benchmarked against the prices of virgin PSF, which in turn, is linked to the prices of PTA and MEG (i.e., derivatives of crude oil). RPSF's prices remain at a 10-20% discount to virgin PSF prices. Any downward movement in crude oil prices makes RPSF less attractive vis-à-vis virgin PSF, as the spread between the two gets narrowed. However, the risk is mitigated to an extent as Polyethylene Terephthalate (PET) waste does not have any other significant usage apart from RPSF manufacturing. Hence, RPSF manufacturers have ability to negotiate input raw material prices in times of declining RPSF prices as evident in resilient margins of GEL over the years.