SYSTEMATIX INSTITUTIONAL EQUITIES

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Circularity Symposium

15 September 2025

Shaping India's circular economy

CONFERENCE TAKEAWAYS

Industry	Recycling & Waste Management

Companies snapshot

	CMP (Rs)	Mkt Cap (Rs bn)
Antony Waste Handling Cell Ltd.	587	17
Godawari Power and Ispat Ltd.	269	181
Hi-Green Carbon Ltd.	215	5
Pondy Oxides & Chemicals Ltd.	1,230	37
Tinna Rubber and Infrastructure Ltd.	825	15
Attero Recycling Pvt Ltd.*	NA	NA
LOHUM India*	NA	NA

*Source: Systematix Institutional Research; Note: * UNLISTED players*

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At our Circularity Symposium (9 Sep 2025), we hosted seven companies present in diverse segments of recycling and waste management. India's recycling industry is growing rapidly, fueled by rising public awareness, supportive government policies and accelerating urbanization. Key policy initiatives (Swachh Bharat Mission, National Action Plan for Waste Management, Extended Producer Responsibility for plastic and electronic waste, Battery Waste Management Rules and National Critical Minerals Mission) provide a boost to the sector. Participating companies represented many activities like collection and sorting, recycling technologies, Waste-to-Energy and public-private collaborations, showcasing their commitment to sustainability and strategic contributions to India's recycling landscape.

Antony Waste Handling Cell (AWHCL; NOT RATED) is a prominent player in India's municipal solid waste management sector and is evaluating plans to develop a larger Waste-to-Energy plant at its Kanjurmarg facility, with a proposed capacity to process 3,000TPD of waste. Its foray into the construction and demolition (C&D) segment opens new growth avenues for the company in this upcoming sector.

Attero Recycling (UNLISTED) is a leading player in e-waste and lithium-ion battery recycling (LIB). It enjoys a market edge over most domestic recyclers through its developed proprietary technology to recover high-value metals from batteries. The company is in the process of doubling its e-waste and LIB recycling capacities in the near term and has outlined a capex plan of Rs 10bn to fuel long term growth.

Godawari Power and Ispat (GODPI; NOT RATED) is a pioneer in India's secondary steel manufacturing sector. From mining iron ore to producing high-quality steel, GPIL's vertically integrated operations reflect precision and excellence across its value chain. The company is strategically diversifying into recycling, battery energy storage system (BESS) and renewable integration.

Hi-Green Carbon (HIGREEN; NOT RATED) specializes in processing waste hydrocarbons to produce valuable products like rCB (Recovered Carbon Black), pyrolysis oil/biofuel, sodium silicate, recycled steel and synthesis gas. It is expanding capacity from 100 TPD to 300 TPD (by the end of FY26) and scale it by ~10x in 7-10 years.

LOHUM India (UNLISTED) manufactures Li-ion battery packs and recycles battery components. On the value-added side, it manufactures cathode active material (CAM) such as Nickel, Manganese, Cobalt (NMC) and Lithium Iron Phosphate (LFP), as well as catalysts for precious and base metals. It is executing huge capacity expansion and is targeting 60% business CAGR by FY30.

Pondy Oxides & Chemicals (POCL; NOT RATED) is primarily engaged in manufacturing lead and lead alloys through recycling. Over time, the company has diversified into recycling within the aluminium, copper, and plastic segments, and envisions diversifying further. POCL's 72ktpa greenfield expansion at TKD, Tamil Nadu, is expected to increase its total lead capacity to 204ktpa from 132ktpa in two phases by FY26. Phase 1 is operational, wherein the company has added incremental capacity of 36ktpa; Phase II trials and production are expected to start in 3QFY26.

Tinna Rubber and Infrastructure (TNR; NOT RATED) is one of Asia's largest recyclers of end-of-life tyres (ELT). It recycles these tyres into crumb rubber to obtain steel wires in the process. The company continuously innovates and applies environment-friendly technologies to convert waste into value-added products, aiming at maximizing stakeholder value. In 2024, TNR took the next leap to diversify into masterbatches and polymer compounds & composites.

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Antony Waste Handling Cell Ltd.

Long-term contracts provide steady visibility

CONFERENCE TAKEAWAYS

Sector: Waste Management	**Rating: NR**
CMP: Rs 587	**Target Price: NA**

Stock Info	
Sensex/Nifty	81,785/25,069
Bloomberg	AWHCL IN
Equity shares (mn)	28.4
52-wk High/Low	859/459
Face value	Rs 5
M-Cap	Rs 17bn/ USD 0.2bn

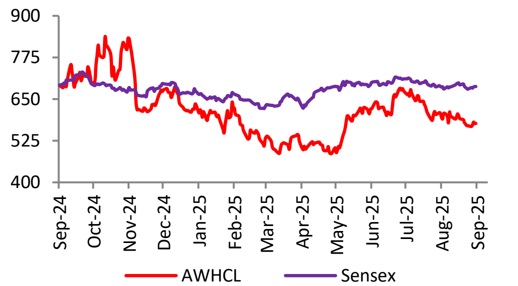
Financial Snapshot (Rs bn)

Y/E Mar	FY23	FY24	FY25
Sales	8.5	8.7	9.3
EBITDA	1.5	1.8	2.1
PAT	0.8	1.0	1.0
EPS	24.1	30.4	30.1
PE (x)	24.6	19.4	19.6
EV/EBITDA (x)	13.3	11.4	9.9
RoE	15.1	16.3	13.8
RoCE	12.7	12.7	11.9

Shareholding Pattern (%)

	Jun'25	Mar'25	Dec'24
Promoter	46.1	46.1	46.1
- Pledged	0.2	0.2	0.2
FII	13.1	11.0	10.5
DII	3.7	4.7	4.4
Others	37.1	38.2	39.0

Stock Performance (1-year)



We hosted Mr. Subramanian N G, CFO, Antony Waste Handling Cell Ltd (AWHCL IN, NOT RATED) at our Circularity Symposium. AWHCL is a prominent player in India's municipal solid waste (MSW) management sector, with over two decades of experience. The company provides services like waste collection, transportation, processing, and landfill management. It operates Asia's largest waste-processing plant at Kanjurmarg, Mumbai, and is Maharashtra's first waste-to-energy (WtE) plant set up under the green energy open access rule. The company is expanding its portfolio through large-scale projects and long-term contracts that provide steady visibility. AWHCL has a robust order book with projects that extend over the next two decades. The stock trades at 10x TTM EV/EBITDA at CMP of Rs 587. We do not have a rating on the stock.

Key takeaways from the conference:

- **Robust outlook on growth**: The company reported Rs 2.2bn revenue, Rs 621mn EBITDA, and Rs 230mn PAT during 1QFY26, which translates into annual recurring PAT in the range of Rs 750–800mn, according to management. Steady growth is anticipated with 8–11% organic volume growth, while management is targeting 18–20% revenue CAGR over the next 5 years.
- **Margin Profile:** Waste processing contracts generate higher EBITDA as this is a capital-intensive business, which explains AWHCL's 22–23% EBITDA margin. In contrast, collection & transportation contracts deliver lower margins.
- **Expanding waste to energy portfolio:** The company is developing two new 15MW plants in Kurnool and Kadapa (Andra Pradesh) at a capex of Rs 3bn capex each and Rs 620mn grants per project, based on a 70:30 debt: equity structure. The 14MW Pimpri-Chinchwad plant generates 2.4bn green units annually, fully procured by Pimpri Chinchwad Municipal Corporation. The revenue models differ by site; for instance, the Pimpri-Chinchwad model earns tipping fees (Rs 504/t) + power revenue (Rs 5/unit), while Kurnool does not have a tipping fee but higher revenue of Rs 8.10/unit.
- **Robust order book:** As of March 2025, the company had an unexecuted order book of Rs 135bn, executable over the next 12 years, with certain projects extending until 2045 and beyond.
- **Construction and Demolition of waste project:** The company has ventured into a new Construction & Demolition (C&D) waste project in Mumbai. The city generates 8,500 TPD of C&D waste, of which only 1,200 TPD is currently being processed - 600 TPD by the company (through its subsidiary) and another 600 TPD by a peer, leaving significant headroom for new entrants. The company's plant, tendered at 600 TPD, has an expandable capacity of 720 TPD (able to handle 20% volume spikes). Operational experience demonstrates high recovery rates of roughly 96%, with most of the processed waste converted into manufactured sand, bricks and other saleable products.
- **Venturing into alternative products:** At the Kanjurmarg facility in Mumbai, nearly 80% of the incoming waste is converted into sellable products such as methane gas for power use and refuse-derived fuel used by cement companies as fuel replacement and compost. Such a model displays the company's position as a circular economy player.
- **Low return ratio:** The company's RoE currently is in low single digit, primarily as high capital deployment and new contract additions have expanded the base.

Godawari Power & Ispat Ltd.

Tapping Growth via New Projects

CONFERENCE TAKEAWAYS	
Sector: Recycling	Rating: NR
CMP: Rs 269	Target Price: NA

Stock Info	
Sensex/Nifty	81,785/25,069
Bloomberg	GODPI IN
Equity shares (mn)	670
52-wk High/Low	253/145
Face value	Rs 1
M-Cap	Rs 181bn/ USD 2bn

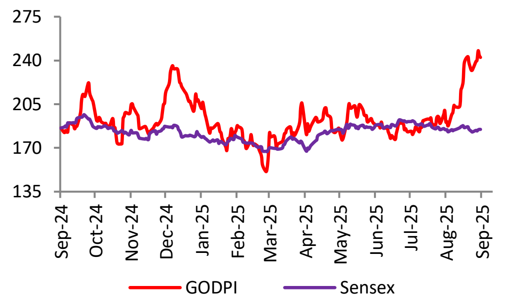
Financial Snapshot (Rs bn)

Y/E Mar	FY23	FY24	FY25
Sales	57.5	54.6	53.8
EBITDA	11.6	13.3	11.9
PAT	7.9	9.36	8.13
EPS	12.2	15.00	13.24
PE (x)	22.0	17.9	20.3
EV/EBITDA (x)	15.1	12.9	14.8
RoE (%)	20.1	20.5	16.5
ROCE (%)	27.2	26.8	21.7

Shareholding Pattern (%)

	Jun-25	Mar-25	Dec-24
Promoter	63.5	63.5	63.5
- Pledged			
FII	6.5	6.6	7.1
DII	2.7	2.4	1.9
Others	27.3	27.5	27.5

Stock Performance (1-year)



We hosted Mr. Dinesh Gandhi (Whole Time Director) Godawari Power & Ispat Limited (GODPI IN, NOT RATED) at our Circularity Symposium. GPIL is a pioneer in India's secondary steel manufacturing sector. From mining iron ore to producing high-quality steel, GPIL's vertically integrated operations reflect precision and excellence across its value chain. The company is strategically diversifying into recycling, battery energy storage system (BESS) and renewable integration. The company expects to fund its upcoming project through a balanced mix of debt and internal accruals. The stock trades at 13x TTM EV/EBITDA at CMP of Rs 269. We do not have a rating on the stock.

Key takeaways from the conference:

- **Recycling business:** The company's recycling business generated Rs 400–500mn EBITDA at the time of acquisition in FY23–24. On consolidation, the company recorded revenue of Rs 7bn and EBITDA of Rs 500–600mn, with potential to scale up to Rs 18–20bn and Rs 2bn over the next three years, respectively. The business was initially towards industrial waste recycling which reduced efficiency, as recycling of industrial waste yields only 30–35% compared to batteries, which generate 60–65% yield. The strategy now is to adopt a mix of batteries and industrial waste recycling, with the aim of improving utilization to 70–80% over two to three years.
- **Sarora plant update:** Management has planned a capex of Rs 60bn for its Sarora plant, Chhattisgarh. The investment includes solar integration, which the company expects to execute over the next 3–4 years, once it secures mining approvals. The expansion is scheduled for completion by 2029 and will be funded through internal accruals and debt.
- **Battery energy storage project:** It has also planned a 10GW BESS project at Aurangabad, Maharashtra, and expects 140 acres of land to be taken on lease for this purpose. The initial capex is estimated at Rs 7bn, including Rs 1.75–2bn for land. The site would be used to scale up BESS capacity to 40GW capacity over 5–7 years and to also set up a solar cell manufacturing plant.
- **Mining expansion:** Mining approvals are critical, as currently, the company purchases 25% of the iron ore from external sources at double the cost. The company is planning substantial expansion and expects mining capacity to rise from 3.05mt to 6.7mt and pellet capacity from 2.7mt to 4.7mt by FY26. Post expansion, management believes the entire plant would be run on captive iron ore. The Boria Tibu mine, Chhattisgarh, currently operates at 0.7mt capacity, with expansion plans of 2–3mt underway.
- **Margin guidance:** Management highlighted that if the existing business is viewed in isolation with full mining integration and additional pellet capacity, margins could exceed 30%. However, consolidation of new projects such as CRM Complex and BESS could dilute the overall margins in percentage terms, though absolute margins would remain high, but boost returns. Management cited focus on RoE and RoCE rather than operating margins.
- **Debt:** Out of the total capital expenditure of Rs 9bn for the CRM initiative, Rs 6bn is set to be funded by debt. Furthermore, ~60% of Rs 7bn capital expenses for the BESS project will be funded by debt.

Hi-Green Carbon Ltd.

Multifold growth in vision

CONFERENCE TAKEAWAYS	
Sector: Waste Management	**Rating: NR**
CMP: Rs 215	**Target Price: NA**

Stock Info

Sensex/Nifty	81,785/25,069
Bloomberg	HIGREEN IN
Equity shares (mn)	25
52-wk High/Low	341/183
Face value	Rs 10
M-Cap	Rs 5bn/ USD 0.1bn

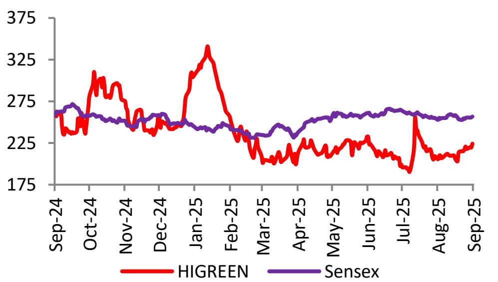
Financial Snapshot (Rs bn)

Y/E Mar	FY23	FY24	FY25
Sales	0.8	0.7	1.0
EBITDA	0.2	0.2	0.2
PAT	0.1	0.1	0.1
EPS	6.5	4.7	4.5
PE (x)	32.3	45.1	47.2
EV/EBITDA (x)	27.4	31.2	28.0
RoCE	51	22	13
RoE	51	14	14

Shareholding Pattern (%)

	Jun'25	Mar'25	Dec'24
Promoter	71.87	71.88	71.86
- Pledged			
FII	2.04	2.22	3.03
DII	2.47	2.47	1.68
Others	23.62	23.42	23.43

Stock Performance (1-year)



We hosted Mr. Amit Bhalodi, MD & CFO, Hi-Green Carbon Limited (HIGREEN IN, NOT RATED) at our Circularity Symposium. HIGREEN is a part of the Radhe Group of Energy, a renewable energy conglomerate. With 15 years of experience, specializing in processing waste hydrocarbons to produce valuable products like rCB (Recovered Carbon Black), pyrolysis oil/biofuel, sodium silicate, recycled steel and synthesis gas. The company has constructed an indigenous process plant with a capacity of 25 tons per day (TPD), which it later scaled up to 50 TPD. Its highly efficient patented technology saves ~60 tons of carbon dioxide emissions while producing 35 TPD of Hi-Green carbon black. The stock trades at 27x TTM EV/EBITDA at CMP of Rs 215. We do not have a rating on the stock.

Key takeaways from the conference:

- **Business overview:** Hi-Green currently operates a 100 TPD plant in Bhilwara (Rajasthan). Its Dhule (Maharashtra) plant has been operational for the past six months and is running at about 70% capacity. A third facility at Dhar (Madhya Pradesh) is under construction and scheduled for commissioning by Oct–Nov 2025. With these expansions, total capacity is set to rise from 100 TPD to 300 TPD by the end of FY26. Over the longer term, the company aims to scale capacity by ~10x within the next 7-10 years.

- **Industry outlook:** India's pyrolysis or rCB industry comprises roughly 700 plants, most of which still rely on low-cost thermal decay technology. In contrast, Hi-Green operates a fully closed system designed to minimize the environmental impact. The company expects biofuel to gradually emerge as a substitute for high-speed diesel in the coming years. Regulatory momentum is also building up globally, with the UK having already passed a regulation mandating blending of bio/recycled oil with Brent last year. The US is likely to follow suit, and India too is looking to impose similar rules.

- **Product portfolio and revenue mix:** For a 100 TPD plant, the revenue mix stands at 40% bio-oil, ~30% rCB and ~30% sodium silicate. In FY25, bulk of the revenue was driven by the Dhule plant, primarily from pyrolysis.

- **Supply chain network:** Hi-Green imports 100% of its raw material requirements. While rCB sales are largely domestic, exports constitute mere 2-3% of sales. The rise in US dollar has inflated raw material costs and any further fall in crude prices could adversely pressure margins, likely impacting profitability, according to management.

- **Growth drivers:** Hi-Green acquired Samsara Recycling Pvt. Ltd is expected to be fully operational this year. The company intends to use syngas at the new Dhule plant for captive consumption instead of producing sodium silicate. Management has a view that this move would help in reducing the working capital requirement and improve margins. Hi-Green is also planning overseas expansion opportunities in the coming year.

- **Government incentives:** In Maharashtra, Hi-Green benefits from 80% subsidy spread over 10 years, in addition to interest subsidy that includes SGST reimbursement and electricity duty exemption. In Madhya Pradesh, the subsidy of 40% is spread over 7 years. From an environmental perspective, producing 1 ton of virgin carbon black requires burning 2.5 tons of crude oil and emits 2 tons of CO_2. This underlines the importance of government policies aimed at reducing carbon footprint, such as Extended Producer Responsibility (EPR) mandates. For instance, the government offers an incentive of Rs 1-1.5/kg on rubber tyres, which translates into Rs 18/kg, including the effect of subsidy, whereas the company is allowed to import for

Rs 15/kg. Even though imports are beneficial, effective government incentives could help improve the cost of borrowing and margins.

- **Key risks:** A key risk lies in the emergence of alternative advance waste tyre disposal technologies. With nearly 90% of the market unorganized, dependency on government's effective policy mandate is imperative.

Pondy Oxides & Chemicals Ltd.

Increasing growth through strategic expansion

CONFERENCE TAKEAWAYS

Sector: Diversified Metals	**Rating: NR**
CMP: Rs 1,230	**Target Price: NA**

Stock Info

Sensex/Nifty	81,785/25,069
Bloomberg	POCL IN
Equity shares (mn)	30
52-wk High/Low	1,336/490
Face value	Rs 5
M-Cap	Rs 37bn/ USD 0.4bn

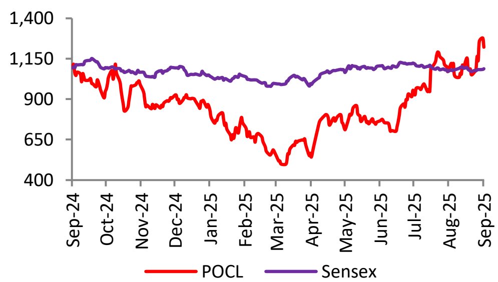
Financial Snapshot (Rs bn)

Y/E Mar	FY23	FY24	FY25
Sales	14.76	15.41	20.57
EBITDA	0.77	0.70	1.05
PAT	0.47	0.32	0.58
EPS	20.03	13.71	20.64
PE (x)	62.1	90.7	60.3
EV/EBITDA (x)	49.2	53.9	36.1
RoCE	28	19	19
RoE	20	10	12

Shareholding Pattern (%)

	Jun'25	Mar'25	Dec'24
Promoter	39.9	40.61	40.59
- Pledged	-	-	-
FII	1.33	2.11	2.83
DII	6.15	4.88	5.05
Others	52.63	52.41	51.53

Stock Performance (1-year)



We hosted Mr. Vijay Balakrishna, CFO, and Mr. Pratik Gupta, Assistant Vice-President – Operations and Strategy, Pondy Oxides and Chemicals Limited (POCL IN, NOT RATED) at our Circularity Symposium. POCL was established in 1995 and is primarily engaged in manufacturing lead and lead alloys through recycling. Over time, the company diversified into recycling for the copper, plastic, and aluminium segments, visioning further diversification in future. The company's ongoing expansion plan includes a 2-phase expansion of its lead capacity from 132ktpa to 204ktpa by FY26. POCL operates four manufacturing units, two of which are in Tamil Nadu (lead, aluminium, and plastics) including the recently commissioned unit at Thervoykandigai (TKD – lead and copper), and one in Andhra Pradesh (lead and copper). Further, POCL holds 123 acres of land bank in Mundra, Gujarat, positioning it well for expansions in future. At Rs 1,230/share, the stock trades at 30x TTM EV/EBITDA. We do not have a rating on POCL.

Key takeaways from the conference:

- **Capex for an efficient system:** POCL's 72ktpa greenfield expansion at TKD, Tamil Nadu is expected to enlarge its total lead capacity to 204ktpa from 132ktpa in two phases by FY26. Phase 1 is operational, wherein the company has added incremental capacity of 36ktpa; Phase II trials and production is expected to start in 3QFY26. The lead recycling facility at TKD would be a pioneering setup that involves integrating battery breaking, smelting, and refining processes to automate material flow, positioning POCL as a unique domestic and global operation.

- **Favorable industry tailwinds and government initiatives:** Favorable government policies (Battery Waste Management Rules [BWMR], Extended Producer Responsibility [EPR] and Reverse Charge Mechanism [RCM]) facilitate recycling in a regulated manner and aim to organize the sector. The company has secured Ministry of Environment, Forest, and Climate Change (MoEFCC) licenses providing it creditability while servicing clients with stringent regulations on insourcing; these licenses act as key entry barrier in the industry. Leading players hope to gain a larger market share once the sector gets organized.

- **Copper expansions:** POCL targets to expand copper capacity from 6ktpa to 12ktpa, with a product mix tilt towards high-margin, downstream portfolio. With copper as the next growth driver, the company has plans for forward integration into downstream products (rods, cathodes, busbars, foils, etc.) and expects to lift margins in the segment from 4% to 10-12% at full scale. The management expects to scale copper segment to contribute 30-35% of total topline in the long term.

- **Growth visibility:** POCL's 123-acre Mundra land acquisition, valued at Rs 420mn, is expected to support expansions over 5-7 years. The location would ensure cost-efficient logistics, given its strategic proximity to major Indian ports. Expansions plans remain primarily focused on lead and copper projects at TKD, after which growth projects at Mundra shall be taken up, as per the management.

- **Financial position:** Management intends to reduce the net working capital cycle from 55 to 45 days over the next two years. The company incurred approximately Rs 1bn in capital expenditure in FY25 and expects to spend another Rs 400-500mn this year, to be funded via internal accruals and QIP proceeds.

- **Procurement mix:** As of 1QFY26, POCL's procurement mix shifted to 80% imports versus 75% in FY25. With favorable policy reforms improving transparency in the domestic supply chain, management expects tailwinds in the sector ahead. Management expects this structural shift to significantly improve raw material collection and enhance supply stability. It is targeting a 65:35 import to domestic sourcing ratio over the next 2 years, which management aims to align with export revenue of 60-65%, helping mitigate currency risk. POCL remains confident of raw material procurement across segments, existing and potential, given its strong 270+ overseas supplier network spanning 70 countries.

Tinna Rubber & Infrastructure Ltd.

Sustainable value creation via recycling, refurbishment, EPR

CONFERENCE TAKEAWAYS

Sector: Recycling	**Rating: NR**
CMP: Rs 825	**Target Price: NA**

Stock Info

Sensex/Nifty	81,785/25,069
Bloomberg	TNR IN
Equity shares (mn)	18
52-wk High/Low	1,726/793
Face value	Rs 10
M-Cap	Rs 15bn/ USD 0.2bn

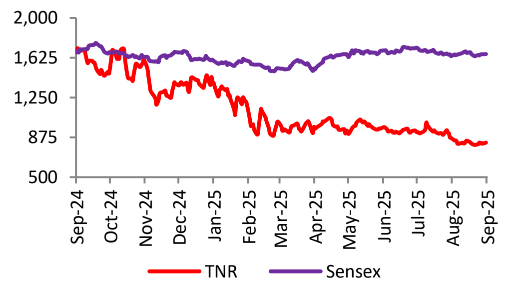
Financial Snapshot (Rs bn)

Y/E Mar	FY23	FY24	FY25
Sales	3.02	3.64	5.10
EBITDA	0.43	0.65	0.81
PAT	0.22	0.40	0.48
EPS	12.7	23.5	28.2
PE (x)	13.6	29.7	32.9
EV/EBITDA (x)	8.1	19.9	21.2
RoCE	24	33	28
RoE	25	36	32

Shareholding Pattern (%)

	Jul'25	Jun'25	Mar'25
Promoter	67.58	67.58	71.08
- Pledged			
FII	0.66	0.66	0.64
DII	5.9	5.9	1.06
Others	25.86	25.86	27.23

Stock Performance (1-year)



We hosted Mr. Subodh Sharma, Director & COO, Tinna Rubber & Infrastructure Limited (TNR IN, NOT RATED) at our Circularity Symposium. Tinna Rubber & Infrastructure Ltd is one of Asia's largest recyclers of end-of-life tyres (ELT) recycling them into crumb rubber and obtaining steel wires in the process. The company continuously innovates and applies environment-friendly technologies to convert waste into value-added products, with the aim of maximizing stakeholder value. In 2024, TNR took the next leap to diversify into masterbatches and polymer compounds & composites. The stock trades at 22.3x TTM EV/EBITDA at CMP of Rs 825. We do not have a rating on the stock.

Key takeaways from the conference:

- **Industry outlook:** India produces about 45 lakh tons of tyres annually and generates ~20 lakh tons per year of waste tyres. The industry sees strong support from major tyre manufacturers like Apollo, Michelin, etc., who are committed to increasing the recycled content (from 3-5% in 2025 and 10% by 2030) in their products.
- **Government mandate drives demand for recycled materials:** The adoption of rubberized bitumen for roads with traffic loads of above 50 Minimum Safety Altitude (MSA) is expected to significantly boost demand in the coming years. Bitumen roads are also cheaper and easier to repair than concrete, indicating a structural demand driver. Additionally, EPR obligations are pushing tyre manufacturers to recycle/offset waste, driving sustainable demand for recycled raw materials.
- **Growth drivers:** With its strong procurement network and global expansion with plants in Oman, Saudi Arabia (KSA), South Africa, TNR is focus on GCC regions and gaining access in other overseas markets. The company is also pursuing backward integration through petrochemical linkages for bitumen, while embedding sustainability practices such as carbon reduction, renewable energy usage and EPR compliance. Crumb rubber (CRM) along with bitumen emulsion represents the most lucrative segment of the infrastructure products at present, contributing ~48% of total revenues. Nearly 70% of natural rubber is consumed for tyre manufacturing in the automotive sector, whereas 20% goes to rubber conveyor belting systems, and 10% is used by dross rubber industry for mats, flooring, playground tiles, etc.; growth in respective sectors ensures raw material supply for TNR.
- **Global presence:** In Oman (99% owned), TNR operates a 10,000 TPA plant at 85% utilization. It has completed rubberized bitumen test track (1 km) in the region, with potential to sell the entire output in GCC; the manpower cost in GCC is slightly higher compared to India.
- **Diversification of product portfolio:** TNR's 100 TPD pyrolysis capacity yields an output of 40% in oil, 35-38% in carbon black, with the rest in steel and gases. It is exploring options to work with Chinese machinery suppliers and carbon consultants going forward.
- **Revenue mix: Infrastructure (50%)** - primarily used in refineries to blend bitumen as well as for direct road development and mixing, **industrial (27%)** - supplies reclaimed rubber and compounds to tyre manufacturers, **steel (12-14%)** - extracted from ELT tyres and sold to casting and forging manufacturers, **granules (12-13%)** - used in flooring, gyms and playground applications, **plastics (3-4% contribution by FY26)** - a new vertical, focused on plastic recycling and masterbatches (black + colored).
- **Capital raise & deployment:** The company raised around Rs 787mn via QIP, with proceeds deployed as follows: **debt reduction -** Rs 230mn; **solar power expansion** – Rs 117mn, **capex for pyrolysis based recovered carbon black** - Rs 218mn and **general corporate purpose** - Rs 190mn. Management projects 20-25% CAGR over FY25 - FY30.

Attero Recycling Pvt. Ltd.

Scaling operations and expansion plans to drive growth

CONFERENCE TAKEAWAYS	
Sector: Recycling	Rating: NR
CMP: NA	Target Price: NA

We hosted Mr. Arjun Gupta, Associate Director, Attero Recycling Pvt. Ltd. (Attero, UNLISTED) through a virtual call at our Circularity Symposium. Attero is a leading player in e-waste and lithium-ion battery recycling. The company has strong presence in the e-waste recycling industry. It has developed proprietary technology in lithium-ion battery recycling that allows the company to recover high-value metals from batteries, giving it a significant edge over most domestic recyclers. It has also built sourcing platforms to streamline procurement and improve margins, with regulatory guidelines supporting a sharp scale-up in utilization and growth. With a healthy mix of e-waste and battery recycling revenues, backed by patents and technological know-how, the company is now expanding capacities across multiple locations.

Key takeaways from the conference:

- **Capacity and market share:** The company operates through a single 144ktpa facility located at Roorkee, Uttarakhand, used for e-waste recycling and 700 tons of lithium-ion battery (LIB) recycling. The company has 20%–25% share in the formal e-waste recycling industry.
- **Financial details:** Of its Rs 9.65bn revenue in FY25, Rs 8.00bn came from e-waste, Rs 600–700mn from LIB recycling, Rs 700mn from e-waste recycling services from a government contract for defense organizations and balance from battery collection services. Of the total e-waste revenue, 15–20% come from Extended Producer Responsibility credits sales, amounting to Rs 1.40–1.50bn. The e-waste business generated EBITDA margin of 8–10%, while batteries operated at 30–35% margin. The company holds 9 granted patents in e-waste and 37 in the LIB segment.
- **Sourcing platforms:** To reduce 10–15% margin leakage across intermediaries, the company has launched two platforms 1) Sell Smart (B2C consumer collection) and 2) Metal Mundi (for level 1–2 aggregators). Management is targeting 30% of e-waste procurement through these channels by 4QFY26.
- **Technological edge in LIB recycling:** Attero is among few companies in India that is capable of extracting key metals such as lithium, cobalt, and nickel directly from battery cells. Most domestic recyclers stop at black mass stage, without recovering these high-value metals. This technological edge differentiates it from other players in the LIB recycling space.
- **E-waste Procurement:** E-waste sourcing is fully domestic since imports are restricted, while batteries have some imports but not significant.
- **Regulatory guidelines boost utilization:** In 2021–22, Central Pollution Control Board issued detailed e-waste management rules, mandating original equipment manufacturer to meet recycling targets. This led Attero to sharply improve its utilization levels from 30% in FY22 to full capacity in FY25. The guidelines have primarily driven growth in the company and management expects even faster growth over the next five years.
- **Capex plans:** The company is adding 75ktpa of new e-waste capacity through three 25ktpa plants in Bangalore, Pune, and Faridabad. It is also scaling its LIB recycling capacity from 700 tons to 2,000 tons. It is looking to commission these plants by Dec 2025/Jan 2026 and fund them through a 75:25 debt–equity mix. The company has a broader Rs 10bn incremental capex program in place, which primarily includes Rs 2.5bn for 150ktpa of additional e-waste capacity, Rs 7bn for 10ktpa of additional LIB recycling capacity and Rs 500mn to meet working capital requirements. To part-fund this expansion, the company plans to raise Rs 4bn in equity over the next 3–4 months.

LOHUM India

Regulatory support and demand incentives drive growth

CONFERENCE TAKEAWAYS	
Sector: Recycling	Rating: NR
CMP: NA	Target Price: NA

We hosted Mr. Siddharth Nautyal, Head- Strategy and New Initiatives, and Mr. Pratyush Sinha, Head – Special Projects, LOHUM India (Lohum, UNLISTED) at our Circularity Symposium. The company manufactures Li-ion battery packs and recycles battery components. It is the largest Indian producer of sustainable battery raw materials through recycling, repurposing, and low-carbon refining. It achieves this by recovering critical raw materials such as lithium, nickel, and cobalt by recycling lithium-ion batteries through NEETM™ technology. Lohum has 9 operational plants out of which 3 plants in pilot stage of commissioning. It is the only NMC (nickel, manganese, cobalt) manufacturer in India for Cathode Active Material (CAM), a key raw material needed in lithium-ion batteries.

Key takeaways from the conference:

- **Strengthening global presence:** Lohum has established its global presence through joint ventures and strategic partnerships. It has collaborated with BEEAH and the Ministry of Energy and Infrastructure, UAE to set up first lithium-ion battery recycling facility in Sharjah. The company has also formed off-take partnerships with Australia, the United States (US), and the European Union (EU), and has an exclusive off-take agreement with the United Kingdom (UK).
- **Diverse product portfolio:** Lohum produces a wide range of metals and value-added products recovered from recycling lithium-ion batteries and other sources. On the value-added side, the company manufactures CAM such as NMC and Lithium Iron Phosphate (LFP), as well as catalysts for precious and base metals. Additionally, Lohum is developing high-TRL (Technology Readiness Level 5+) products like graphene oxide, lithium metal, and magnets, showcasing its focus on advanced materials for next-gen energy applications.
- **Cost advantages:** Lohum's refining operations demonstrate a significant cost edge. Its opex at Rs 100/kg is lower than that of China's at Rs 100–150/kg and far below that of the US/EU at Rs 200–360/kg. Similarly, its capex of Rs 150/kg is competitive with that of China at Rs 120–200/kg, but much lower than that of the US/EU at Rs 500–1,200/kg. Such benefit on cost allows Lohum to operate sustainably even in low commodity price environments. Notably, its cobalt refining costs are already lower than the Chinese average, with the potential to reduce further to USD 1.9/lb upon expansion.
- **Key growth drivers:** The three strategic growth drivers for Lohum include a) it has positioned itself strategically and offers lower costs compared to China, while emerging as a reliable global alternative, b) government-led circularity policies, prioritized by the Prime Minister's Office, are expected to provide regulatory support and demand incentives, and c) it is looking to derive benefit from the growing domestic demand for critical minerals through import substitution opportunities.
- **Technological advancement and innovation:** Lohum follows a multi-disciplinary technology approach, wherein it integrates chemical engineering, materials science, cell and battery behavior, software, and data science. The company employs over 100 full-time R&D staff (10% of its workforce), has achieved world-class recovery rate of 90% for lithium and 95%+ for nickel, cobalt, aluminum, and copper. It is the only company in India which has the capacity to refine lithium at scale. Additionally, Lohum has built a strong intellectual property portfolio with 26 patents filed and over 250 claims, covering areas such as battery recycling, material innovation, energy storage, process innovation, and battery regeneration and reuse.

- **Financial metrics:** Lohum has recently raised funds at a valuation of Rs 35bn**.** Management has set ambitious revenue milestones and is targeting revenues of Rs 24bn by March 2026, Rs 57bn by March 2028, and Rs 100bn by March 2030. To support this scale, it has guided cumulative capex of about Rs 7bn by 2026, Rs 17bn by 2028, and Rs 30bn by 2030. A mix of internal accruals, debt, and equity, with a planned equity raise of Rs 6–7bn by March 2026 would be used to fund this capex. An IPO is scheduled for mid-2027 to further support expansion. Management expects the company to expand at 60% CAGR over FY30.

- **Global policy momentum on critical minerals:** Several major economies have recently introduced national strategies and policies to secure critical mineral resources, essential for clean energy technologies and battery manufacturing. The United States (US) had enacted the Energy Act in 2020, while the European Union (EU) introduced the Critical Raw Materials Act in 2023, Japan had launched its New International Resources Strategy in 2020, Australia announced the Critical Minerals Strategy 2023-2030, whereas Canada and South Korea implemented their respective critical minerals strategies in 2023. This throws light on global efforts being made to reduce dependency on limited sources and make the supply chain resilient. China controls around 80-85% of value chain supply in rare earth minerals, on the other hand India is targeting to set up around 50 overseas mines and 1,200 domestic critical mineral projects to expand its market presence and move towards self-sufficiency.

- **Government policies to boost recycling capacity:** The cabinet has approved Rs 15bn incentive scheme to promote the recycling of critical minerals in India. The PLI scheme is designed to attract participation and incentivize brownfield and greenfield expansions across large companies (incentive cap of ~Rs 500mn) and startups (incentive cap of Rs 250mn), thereby accelerate recycling capacities. The scheme would apply to investments in new units and to those expanding capacity/modernizing and diversifying existing units. This policy forms a part of government’s National Critical Mineral Mission (NCMM) with a budget of around Rs 343bn over FY2025-2031. The scheme identifies 30 critical minerals in India with a focus on lithium, nickel, cobalt, and rare earth elements.

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