

PRE-INVESTMENT MEMORANDUM

Maharashtra E-Waste and Copper Recovery Project

Investor Project Report

Bhiwandi / Thane preferred base | Tarapur / Boisar conditional Palghar alternative

Prepared 8 September 2026

Evidence cut-off 20–24 August 2026 | Status: senior-review-ready / screen-grade

Investment conclusion

Proceed only to Stage 0/Stage 1 validation now. Release scale capital only after measured feed trials, written supply and offtake terms, and a plot-specific compliance path are documented.

Published research site

[Open the validated Maharashtra feasibility site](#)

Important notice This is an investor-screening memorandum based on a validated feasibility package. It is not an offer, solicitation, valuation opinion, credit approval, or guarantee of returns. It does not imply affiliation with McKinsey, a named investment bank, or any other advisory firm.

Investment committee summary

Recommendation **PROCEED CONDITIONALLY**

The opportunity is investable as a staged validation program, not yet as a fully funded 800–1,500 TPA copper-recovery plant. The central underwriting question is whether the promoter can lock a copper-rich, repeatable feed portfolio and buyer payability before taking on fixed assets and working-capital exposure.

Decision item	Investment view	Current status
Immediate funding	Release only a controlled Stage 0/Stage 1 validation envelope	₹3.5–8.5L toll test; ₹14–20L pilot
Scale capital	Defer until grade, yield, compliance and offtake gates close	Indicative ₹1.93–3.06cr hybrid/rented program
Preferred base	Bhiwandi / Thane for Mumbai-region feed and buyer access	Palghar conditional on industrial feed contracts
Core product	Copper-rich sorted fractions plus aluminium, steel, PCB and compliant service revenue	Chemical refining excluded from base case
Buyer price indications	Use ₹1,100–₹1,300/kg as an upside sensitivity only until paid-lot evidence exists	Phone-reported; no written payability or invoice yet
Return framing	Use milestone-based capital release; do not promise IRR or valuation yet	No audited accounts, signed LOIs or measured commercial yields

Evidence note The capital figures are scenario ranges from the validated machinery, premises and pilot workbooks. The buyer prices are phone-reported indications supplied by the promoter, not written quotes, invoices or a financing sanction.

Project snapshot

Dimension	Current project definition
Location	Bhiwandi / Thane preferred for Phase 1; Tarapur / Boisar in Palghar only if recurring industrial feed and permits are demonstrated
Target scale	800–1,500 tonnes per year of mixed e-waste input; original target of 80–120 tonnes per year recovered copper remains unvalidated
Recommended sequence	Existing-plant toll test → sub-₹20L manual / stripper pilot → hybrid mechanical scale
Customers	Copper scrap traders, wire and cable manufacturers, secondary smelters and authorized downstream recyclers
Buyer price evidence	Potential buyers have indicated approximately ₹1,100/kg for lower-quality copper and ₹1,300/kg for recycled copper; product specification and payability remain to be documented
Feedstock priorities	Manufacturing, telecom/network/UPS and enterprise IT; hospitals and ELV yards are selective partner channels
Hard exclusions	Chemical refining, loose or damaged batteries, whole ELVs, clinical waste and imports unless separately authorized

What investors are underwriting

- A sourcing and compliance platform that converts traceable B2B e-waste into saleable metal fractions.
- Grade discipline and mass-balance controls, not headline tonnage, as the primary margin protection.
- An asset-light de-risking path that tests feed and buyer payability before irreversible machinery spend.
- A staged capital program sized for working capital rather than only machinery and fit-out.
- A location strategy that keeps Bhiwandi as the default and uses Palghar only when industrial supply contracts justify the extra distance.

No return forecast at this stage

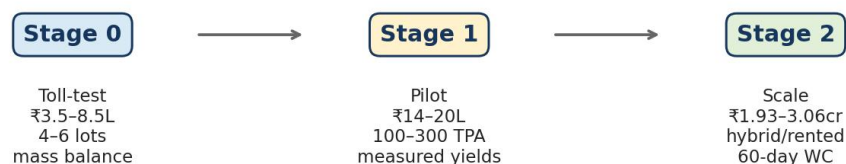
A defensible IRR, valuation, debt-service profile or exit multiple cannot be calculated from the current evidence. The missing inputs are signed supply terms, buyer payability formulas, measured yields, audited company accounts, final site costs and a validated regulatory pathway.

Contents and decision path

Section	Purpose for investors
1 Investment thesis	Why the model could work and what must be true
Strategic option after pilot	Conditional process-standardization and consolidation path after Year 1 evidence
2 Business model	End-to-end value chain, revenue streams and operating boundaries
3 Market and location	Bhiwandi versus Palghar and supplier-channel assessment
4 Feedstock and quality	Copper-grade logic, sourcing lanes, sampling and buyer payability
5 Operations and compliance	Plant concept, safety, certificates and outsourced risk routes
6 Capital plan	Stage gates, machinery strategies, premises and working capital
7 Economics and buyer evidence	Screen-level unit economics, buyer indications and downside cases
8 Risk register	Key failure modes and mitigations
9 Execution plan	90-day diligence and pilot program
10 Investor diligence	Information required before scale capital
Appendix	Evidence posture, definitions and source register

Decision principle

Capital should move only from one evidence gate to the next. A positive desktop model is not a substitute for a measured one-tonne trial, an executable site, or a buyer formula that shows how copper quality is paid.



Capital is released only when the preceding stage's evidence gates are met.

Figure 1. Recommended capital release sequence

1 Investment thesis

The project sits at the intersection of compliant e-waste handling, reverse logistics, materials recovery and copper-scrap aggregation. The opportunity is real, but the proposed output target is sensitive to the composition of the feed and the commercial deductions applied by buyers.

Thesis point	Why it matters	Underwriting implication
Grade is the business	A low-copper office IT mix can destroy margin even when throughput is high.	Acquire by lane and expected grade, not by tonnes alone.
Working capital is a hidden bottleneck	At 1,000 TPA and ₹42,000–48,000/t, 60-day feedstock float alone is approximately ₹70–80L.	Ring-fence an explicit WC facility and payment-cycle plan.
Compliance is part of the moat	Traceability, data destruction and authorized downstream routing improve access to enterprise feed.	Treat permits, chain of custody and audit trails as commercial assets.
Location is a network decision	Bhiwandi offers logistics and buyer density; Palghar may offer industrial supply but needs a stronger local route.	Select site after supplier and buyer letters, not rent alone.
Asset-light validation lowers risk	Toll processing and small pilots can test actual mass balance before a full line is purchased.	Stage capital and preserve option value.

Investment case in plain language

- If the project can source a repeatable mix of cable-rich telecom, UPS, network and industrial electrical material at a price consistent with its copper content, the mechanical recovery model can be commercially attractive.
- If the project buys generic mixed office e-waste at open-market prices without grading or supplier discipline, the copper output target and margin case are not credible.
- The most investable version is a compliant service and materials platform: collection, data destruction, dismantling, sorting, documented downstream routing and sale of graded fractions.
- The least investable version is an uncontracted plant that relies on spot feed, assumes benchmark copper prices are received in full, and carries battery, hazardous or chemical-processing risk without the required authorizations.

Investment committee decision

Decision requested

Approve diligence and Stage 0/Stage 1 validation only. Do not approve full-scale fixed-asset financing until the go/no-go gates in Section 9 are signed off.

Strategic option after pilot

If the first year produces repeatable evidence on feed variance, recovery, product grade, buyer payability and operating cost, the company can pursue a higher-value platform strategy. The option is to standardize copper-quality processes and then scale through partnerships, management contracts or selective acquisitions of compliant small and medium processors. This is not part of the current base case or Stage 1 funding ask.

Phase	Strategic objective	Evidence that must be earned	Capital posture
Year 1 Operating laboratory	Use the Bhiwandi pilot to map supplier lanes, contamination, copper recovery, residue and buyer deductions.	Lot-level dataset, external assays, paid buyer trials, repeatable unit economics and compliance records.	Stage 0/Stage 1 only; no acquisition capital.
Year 2 Process and quality playbook	Convert the operating data into standard work, grade specifications, quality controls and a process-improvement roadmap.	Documented SOPs, validated process windows, lower rejection rates and evidence of buyer willingness to pay for consistency.	Selective equipment, testing and process-development spend; no unproven 99.9% claim.
Year 3 and beyond Network and consolidation	Partner with or selectively acquire suitable processors and centralize quality assurance, offtake, traceability and specialist downstream routes.	Audited plant economics, target pipeline, clean permits, liability review, integration plan and contracted demand.	Separate growth or acquisition financing; partnerships may be preferable to ownership.

Evidence note This roadmap is a contingent strategic option drawn from the promoter's 8 September 2026 discussion. It is a hypothesis for future scale, not evidence that proprietary refining IP, acquisition targets or investor commitments currently exist.

Potential value proposition

Customer problem	Platform response to validate
Inconsistent copper quality from fragmented processors	Common grade codes, sampling, assay, process controls and buyer-facing certificates.
Small plants cannot provide dependable volume	Aggregate compliant supply while preserving lot-level traceability.
Buyers face rejection and negotiation friction	Use historical deductions and assay results to improve specification and settlement predictability.
Plants carry uneven safety and compliance standards	Centralize EHS, downstream routing, training and audit discipline.

The investor thesis should be framed as a data-driven copper-recovery and quality-standardization platform. It should not be framed today as a private-equity fund, a guaranteed roll-up or a producer of LME Grade-A cathode.

Strategic-capital guardrails

- A climate, circular-economy or deep-tech investor may be a potential fit only after the project demonstrates a repeatable process advantage and scalable operating system. No statement is made that Rainmatter, Zerodha or any named investor has reviewed, endorsed or committed capital.
- A roll-up requires acquisition diligence: permits, land and lease rights, environmental liabilities, debt, labour claims, machinery condition, customer concentration and downstream contracts.
- Partnerships or management contracts may be safer than buying plants before the process playbook and integration model are proven.
- Mechanical sorting does not create refined 99.9% or 99.99% copper. Any higher-purity claim must be tied to a defined product, independent assay and an authorized metallurgical route.

Investor wording

We are building a data-driven copper-recovery and quality-standardization platform. Year 1 proves grade and payability; later phases may scale through process replication, partnerships and selective acquisitions of compliant processors.

2 Business model and value chain

The recommended operating model is a B2B reverse-logistics and dismantling platform. It earns from a combination of service discipline and material recovery, while sending hazardous, chemical and specialist streams to authorized downstream partners.

Step	Operating activity	Control point	Revenue / value
1 Source	Contract with enterprises, manufacturers, telecom operators, institutions and selective channel partners.	Supplier identity, material description, weights, data-bearing scope and EPR documentation.	Collection fee, purchase spread or service fee.
2 Collect	Schedule pickup, weigh and record lot at source and arrival.	Chain of custody, transport documents, photos and lot ID.	Service quality and repeatability.
3 Prepare	Data destruction, depollution and manual dismantling within approved scope.	Data-erasure evidence; batteries and hazardous parts separated.	Service fee; risk reduction.
4 Sort	Separate copper-rich cable, boards, aluminium, ferrous, plastics and residues.	Grade code, contamination, moisture and mass balance.	Higher payability and lower deductions.
5 Process	Use cable stripping, granulation or mechanical separation only where economics and controls close.	Dust, fire, noise, guarding and machine capacity within consent.	Improved product grade and recovery.
6 Sell	Sell graded fractions to traders, wire/cable makers, smelters and authorized downstream partners.	Buyer formula, assay, payment cycle and rejection terms.	Copper and non-copper material revenue.
7 Report	Issue downstream and compliance records to customers and regulators as required.	Document retention and audit trail.	Customer retention and EPR/service defensibility.

Evidence note The value chain reflects the validated feasibility package. It is not a license to accept every waste category; each stream must be matched to the approved authorization and downstream route.

Revenue architecture

Revenue stream	Base-case treatment	Why it is not fully underwritten yet
Recovered copper and copper-rich fractions	Core revenue	Actual grade, recovery, payability and deductions are unmeasured.
Aluminium, steel, PCB and clean plastic fractions	Supporting revenue	Prices, contamination and buyer terms vary by lot.
Collection, data destruction and compliance service	Potential margin stabilizer	Requires signed customer scope, SLA, data process and price card.
EPR-linked economics	Upside only	Registration, category, evidence and current rules must be confirmed.
Precious metals, batteries and critical minerals	Excluded from base case	Requires specialist partners, authorization and separate economics.

3 Market, location and supplier channels

Bhiwandi and Palghar should be compared as supply-chain systems, not simply as rent locations. The site must connect three networks: compliant feed, an executable operating envelope and buyers who will pay for the resulting grade.

Bhiwandi versus Palghar

Criterion	Bhiwandi / Thane	Palghar / Tarapur-Boisar-Wada	Investor read-through
Feed access	Strong Mumbai, Thane, Navi Mumbai and institutional IT route.	Better fit for Tarapur/Boisar/Wada industrial and manufacturing routes.	Bhiwandi wins enterprise density; Palghar can win contracted industrial lanes.
Logistics	Deep warehouse and transport ecosystem; closer to Mumbai buyers.	Longer Mumbai distance; route economics depend on supplier clustering.	Model round-trip cost and pickup density before choosing.

Criterion	Bhiwandi / Thane	Palghar / Tarapur–Boisar–Wada	Investor read-through
Buyer access	Regional scrap traders, cable makers and smelter routes are easier to reach.	Buyer access exists but is less concentrated near every site.	Keep buyer quotes and payment cycles location-specific.
Competition	Higher competition in the Mumbai–Pune belt.	Potentially less direct competition but not a blank market.	Competition is acceptable if feed quality and service are differentiated.
Permitting / site risk	Warehouse use does not automatically equal e-waste permission.	Plot-specific industrial, fire, drainage, power and insurer screens are critical.	No lease commitment before a written site compliance screen.
Phase-1 view	Preferred default base.	Conditional alternative.	Palghar needs supplier letters and buyer/offtake evidence to overcome distance.

Location recommendation

Use Bhiwandi for Phase 1 unless Palghar suppliers provide recurring industrial feed by weight and the buyer route offsets the added distance. If Palghar clears the gates, Tarapur/Boisar is the stronger first sub-cluster; Wada is a lower-density expansion option.

Supplier-channel feasibility

Channel	Priority	What can be accepted	Key boundary
Manufacturing	High 4.0/5	Electrical scrap, copper-bearing assemblies, cable and obsolete equipment from industrial plants.	Vendor onboarding, auction terms, contamination and plant-specific pickup windows.
Telecom	Medium-high 3.5/5	Network equipment, cable, UPS and decommissioned infrastructure where custody is clear.	Tender-driven; batteries and data-bearing equipment need separate controls.
Hospitals	Medium-selective 2.5/5	Non-clinical IT, UPS, networking and office electronics only.	Clinical and biomedical waste is a separate regulated route.
ELV / car scrap yards	Medium partner-only 2.5/5	Only eligible, depolluted electronic components through an authorized vehicle-scraping route.	No whole ELV or mixed automotive waste without RVSF-compatible scope.
Enterprise IT / data centres	High-quality prospect	Servers, networking, UPS and data-bearing equipment with secure destruction.	These are suppliers / service customers, not copper buyers.

Evidence note Priority scores are screening judgements from the validated addendum, not market-share estimates or committed supply.

4 Feedstock, copper grade and product quality

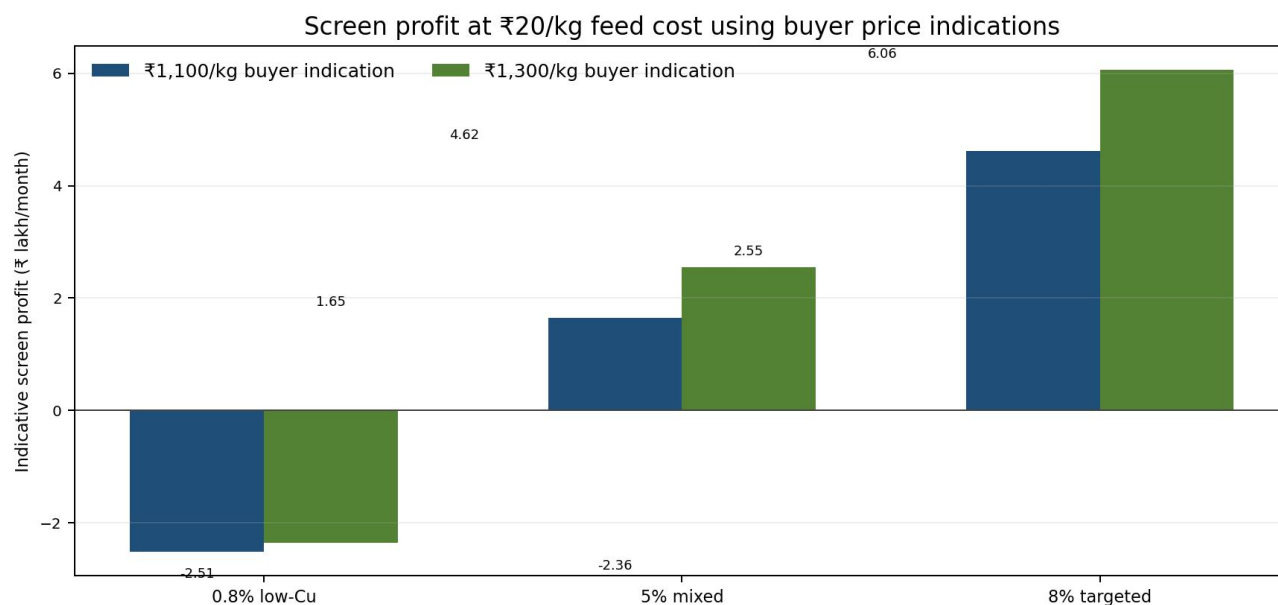
The original 80–120 TPA copper target is a composition claim before it is an operating plan. At 800–1,500 TPA input, the target is achievable only with a copper-rich contracted portfolio, strong segregation and measured recovery.

Copper-content reality check

Illustrative feed proxy	Contained Cu proxy	Recovered Cu at 90% recovery	Read-through at 1,000 TPA input
Low-Cu office IT	0.8%	7.2 TPA	Far below target; negative screen economics at paid feed.
Mixed network / UPS	5.0%	45.0 TPA	Near break-even in the screen; below 80–120 TPA target.
Targeted telecom / UPS	8.0%	72.0 TPA	Better economics; still below 80 TPA at 1,000 TPA.
High-Cu proxy	11.0%	99.0 TPA	Within the original target range, but not a generic mixed-e-waste assumption.

Critical underwriting point

Reaching 120 TPA copper from 800 TPA input would imply more than 16% contained copper before recovery losses. That is not a reasonable generic mixed-e-waste assumption; it requires a deliberately contracted high-grade portfolio or a different input boundary.



Source: validated 10 t/month screen; ₹20/kg feed cost; excludes capex, interest, tax and working-capital financing.

Figure 2. Buyer price sensitivity at paid feed

Evidence note Composition proxies are transcribed screening inputs, not a guarantee for a specific supplier. Screen profit is not EBITDA and excludes capex, interest, tax and working-capital financing.

Quality system required before scale

- Assign a lot ID at pickup; record gross weight, tare, category, supplier, photographs and data-bearing scope.
- Use lane-specific sampling: a one-tonne trial should report input mass, copper-rich output, non-copper output, residue, moisture/contamination and recovery percentage.
- Create grade codes that buyers recognize; keep cable, copper-rich assemblies, mixed boards and low-value mixed IT separate.
- Agree buyer assay, payability, moisture, contamination, freight, GST, settlement and rejection terms in writing before purchasing meaningful volumes.

- Use a two-stage release: pay a controlled amount at pickup and reconcile final settlement only after the buyer's weighment/assay terms are understood.
- Keep precious metals, batteries and hazardous fractions in separately tagged, authorized routes; never let upside assumptions contaminate the copper base case.

Ways to improve copper grade

Method	Effect	Investment / risk note
Source by category	Raises average contained copper before processing.	Most valuable intervention; depends on supplier contracts.
Manual pre-sort	Removes plastics, ferrous and low-value mixed material early.	Low capex; requires training and consistent SOPs.
Cable stripping / granulation	Produces more uniform copper-rich product.	Dust, guarding, noise and fire controls required.
Magnetic / eddy-current separation	Improves removal of ferrous and aluminium fractions.	Use only where product mix and throughput justify it.
Closed-loop buyer feedback	Connects buyer deductions back to source and sorting decisions.	Requires lot-level data, not only monthly totals.
Chemical recovery	May recover higher-value metals from selected streams.	Exclude from initial model; materially higher compliance, safety and capex risk.

5 Operations, machinery and compliance

The recommended first facility is a controlled mechanical dismantling and sorting unit. It should be designed around the approved waste categories and consented capacity, rather than a machine seller's nameplate. The preliminary machine list reviewed for this update is a planning estimate, not a fixed quotation.

Operating concept

Zone	Core requirement	Investor diligence question
Inbound and quarantine	Covered storage, weighbridge or scales, lot tagging and inspection.	Can the unit isolate unknown, wet, damaged or battery-containing loads?
Data destruction	Controlled access, documented wiping / destruction procedure and certificate trail.	Is the data-bearing chain of custody acceptable to enterprise customers?
Manual dismantling	Benches, tools, PPE, ergonomic layout and component segregation.	Can the team sustain quality without unsafe shortcuts?
Mechanical processing	Cable stripping / granulation / separation only within controls.	Do dust, noise, guarding, electrical load and fire systems match consent?
Fraction storage	Separate, labelled bins for copper, aluminium, steel, boards, plastics and residue.	Can mass balance be reconciled by lot and by buyer?
Dispatch and records	Authorized downstream documents, weighment and buyer settlement file.	Is every residue route documented and auditable?

Machinery strategy

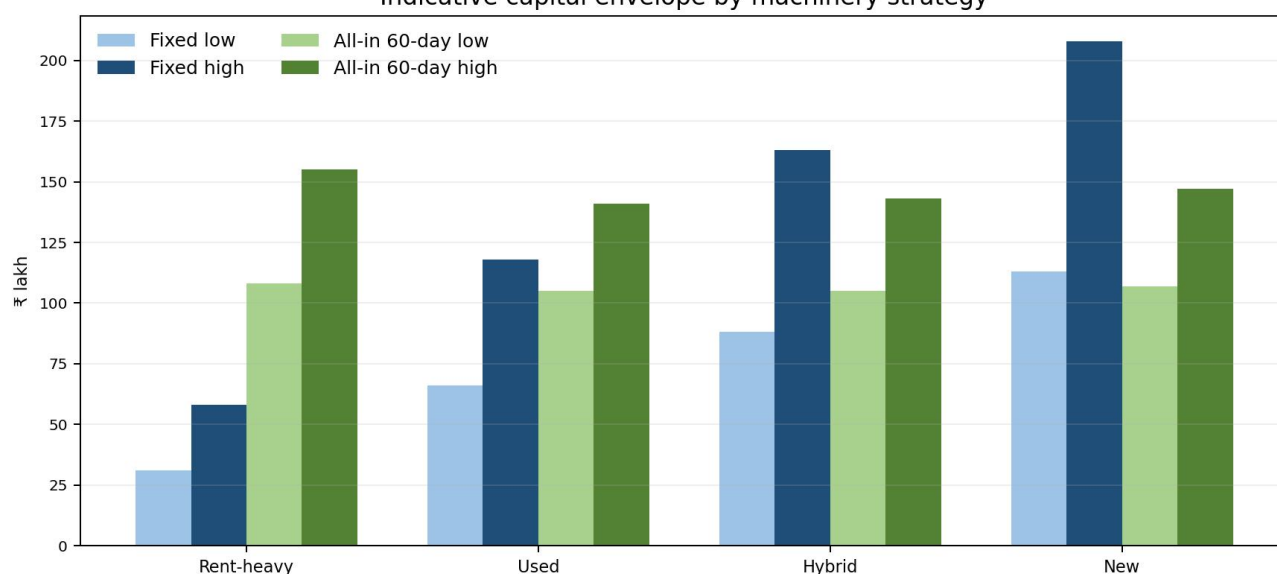
Strategy	Fixed equipment / fit-out	Best use	Main risk
Rent-heavy / toll-processing	₹31–58L	Feed discovery and early commercial trials.	Low control over processing economics and partner availability.
Used equipment	₹66–118L	When equipment history, warranty and service are verified.	Downtime, hidden refurbishment and safety defects.
Hybrid staged	₹88–163L	Recommended scale path after pilot proof.	Requires disciplined sequencing and a credible maintenance plan.
Brand-new	₹113–208L	Only after feed, offtake and permits are locked.	Capital tied up before commercial proof; vendor lead time.

Pilot machinery interpretation

Decision	Recommended treatment	Reason
Buy in Stage 1	Manual dismantling tables, scales, bins, hand tools, basic cable stripper / granulator and required dust/fire controls.	Supports a small measured pilot and keeps the line focused on copper-rich feed.
Gate to Stage 2	Eddy-current separation, electrostatic separation, larger automatic baler and other capacity-heavy equipment.	Only worthwhile after actual feed mix, particle size and buyer deductions are proven.
Outsource initially	XRF screening, laboratory assay and PCB / battery / hazardous downstream processing.	Testing is needed before ownership; specialist routes require separate controls.
Quote requirement	Obtain at least three itemized quotes including GST, freight, installation, electrical load, guarding, dust control, commissioning, warranty and spares.	The ₹18–22L machinery estimate is not an installed or fixed price.

An electrostatic separator may improve dry, size-controlled copper/plastic separation after granulation, but it does not refine mixed copper into 99.9% copper. Quality is created primarily through sourcing, pre-sorting and controlled processing, then verified by assay.

Indicative capital envelope by machinery strategy



All-in figures include the scenario's initial working-capital reserve; rented-premises rows exclude site purchase.

Figure 3. Machinery strategy and all-in capital envelope

Evidence note The capital ranges are scenario outputs from the validated machinery and premises workbook, supplemented by the reviewed preliminary machine list; they are not vendor quotes. Owned-premises rows exclude land, building, civil work and stamp duty.

Certificates and regulatory workstream

Workstream	Expected requirement / evidence	Status before investment
Entity and tax	Company / LLP or proprietorship, PAN, GST where applicable, Udyam and bank KYC.	Promoter-specific diligence required.
Pollution control	MPCB consent to establish / operate and applicable e-waste authorization / registration route.	Plot-specific and category-specific; do not assume a warehouse is approved.
EPR / records	Producer / recycler / refurbisher records, manifests and downstream evidence as applicable.	Keep EPR upside out of base case until registered and evidenced.
Hazardous and battery routes	Separate authorization and authorized recycler chain for batteries, hazardous components and residues.	Exclude loose/damaged cells from base feed.
Fire and safety	Fire NOC / system, emergency plan, extinguishers, electrical safety, PPE, training and incident logs.	Insurer and local authority screen required.

Workstream	Expected requirement / evidence	Status before investment
Labour / factory	Shops and Establishments or Factories Act applicability, DISH / occupational safety requirements as applicable.	Confirm against headcount, power and machinery configuration.
Insurance	Property, machinery breakdown, public liability, workers compensation and environmental liability review.	Obtain quotes before lease and capex.

Compliance boundary

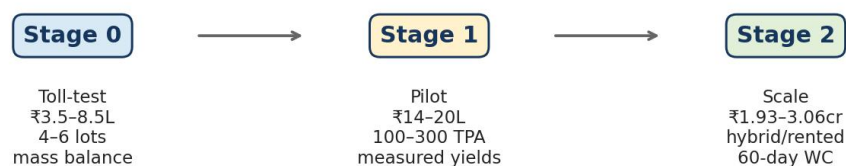
The report does not certify that the proposed activity is approved. Before signing a lease or accepting commercial material, obtain written professional confirmation of the exact MPCB, fire, factory, battery, hazardous-waste, data-destruction and downstream requirements for the selected plot and waste categories.

6 Capital plan, premises and working capital

The original ₹1–1.5 crore estimate is not an all-in scale budget when working capital, deposits, commissioning, compliance, residue handling and buyer payment cycles are included. A staged program is more defensible for investors.

Recommended stage gates

Stage	Purpose	Indicative capital	Release condition
Stage 0	Test representative lots through an existing authorized plant.	₹3.5–8.5L	Written MOU, current authorization, lot mass balance, buyer trial.
Stage 1	Run a small manual / cable-stripper pilot from a compliant rented site.	₹14–20L	Three supplier lanes, two buyer letters, site approval, measured recovery.
Stage 2	Deploy hybrid mechanical line with rented premises and a formal WC plan.	₹1.93–3.06cr	Repeatable grade, signed supply/offtake, compliance close, 60-day WC funding.



Capital is released only when the preceding stage's evidence gates are met.

Figure 4. Tranche-based capital release

Capital scenarios

Scenario	Fixed equipment / fit-out	Monthly rent / equipment cost	All-in 60-day capital	Investor view
Rent-heavy / toll-processing	₹31–58L	₹1.5–4.0L rent	₹108–155L	Best for validation; weak control over processing availability.
Used equipment	₹66–118L	₹0–0.5L equipment rental	₹105–141L	Potential value if inspected, warranted and serviceable.
Hybrid staged	₹88–163L	₹0.5–2.0L	₹105–143L	Recommended scale configuration after proof.
Brand-new	₹113–208L	₹0–0.5L	₹107–147L	Use only after contracts and permits; may exceed range with site surprises.

Evidence note The all-in figures reflect the existing scenario model and its defined reserve; they should not be mechanically added to fixed capex again. Confirm line-item scope with vendor quotes.

Working capital is the gating item

Input capacity	Feed price	Monthly feed cash	60-day feed-only float	90-day feed-only float
800 TPA	₹42,000/t	₹28.0L	₹56.0L	₹84.0L
1,000 TPA	₹42,000–48,000/t	₹35.0–40.0L	₹70.0–80.0L	₹105.0–120.0L
1,500 TPA	₹48,000/t	₹60.0L	₹120.0L	₹180.0L

Evidence note Feedstock-only float excludes wages, rent, power, transport, GST, residue disposal, capex and buyer deductions. It also assumes continuous monthly purchasing, which should not be adopted until supply is contracted.

Financing implication

At 1,000 TPA, a 60-day feedstock float of roughly ₹70–80L can consume a large portion of the original ₹1–1.5cr project estimate. A lender or investor should underwrite the working-capital line, promoter margin and payment cycle separately from machinery.

Premises strategy

- Use a rented, compliant industrial shed for pilot and first scale; do not purchase land or building before the operating model is proven.
- A Bhiwandi warehouse benchmark of approximately ₹23/sq ft/month for 5,000 sq ft implies about ₹1.15L/month before deposit, fit-out, power, insurance, fire systems, taxes and site-specific compliance. Treat it as a market benchmark, not a quote or permission.
- Palghar can be attractive where the industrial supplier cluster is real, but a lower rent does not offset empty return trips, weak buyer density or a site that cannot secure approvals.
- Lease clauses should cover permitted use, waste storage, fire loading, power load, drainage, access hours, inspection rights, restoration and exit rights.

7 Economics, buyer evidence and funding logic

The new buyer conversations improve the revenue sensitivity, but they do not yet replace the conservative base case. The figures below treat ₹1,100–₹1,300/kg as phone-reported indications that must be tested against the project's actual copper product, assay, deductions and settlement terms.

Buyer price update

Evidence point	Indicated price	Underwriting treatment
Lower-quality copper indication	Approximately ₹1,100/kg	Use as a sensitivity only until supported by a written buyer formula or paid lot.
Recycled copper indication	Approximately ₹1,300/kg	Use as an upside sensitivity; confirm what purity and product form qualify.
Earlier conservative screen	₹650–₹750/kg	Retain as a downside reference until the new indications are documented.

The price evidence is commercially useful because it came from direct phone conversations with potential buyers. It is not yet a customer contract, invoice or guaranteed payability schedule. The price must be matched to e-waste-derived granules or clean copper output, not assumed from a different scrap category.

10-tonne-per-month screen at buyer indications

Feed profile	Cu content	₹1,100/kg: free / ₹20 / ₹40	₹1,300/kg: free / ₹20 / ₹40
Low-Cu office IT	0.8%	₹-0.51 / -2.51 / -4.51L	₹-0.36 / -2.36 / -4.36L
Mixed network / UPS	5.0%	₹3.65 / 1.65 / -0.35L	₹4.55 / 2.55 / 0.55L
Targeted cable-rich	8.0%	₹6.62 / 4.62 / 2.62L	₹8.06 / 6.06 / 4.06L

Each price cell shows indicative screen profit at free transfer, ₹20/kg feed cost and ₹40/kg feed cost, respectively.

Break-even copper-content threshold in the screen

Copper price	Feed cost	Approx. Cu threshold	Interpretation
₹1,100/kg	₹0/kg	1.31%	Free-transfer or service-fee supply can tolerate lower grade.
₹1,100/kg	₹20/kg	3.33%	Paid feed requires a mid-grade portfolio.
₹1,100/kg	₹40/kg	5.35%	Higher acquisition cost requires targeted copper-rich feed.
₹1,300/kg	₹0/kg	1.11%	Higher payability helps, but low-grade feed remains fragile.
₹1,300/kg	₹20/kg	2.82%	A mid-grade portfolio can work if deductions stay controlled.
₹1,300/kg	₹40/kg	4.53%	Price alone does not remove the need for grade discipline.

Evidence note Screen assumptions: 10 t/month, 90% copper recovery, ₹2.2L/month net non-copper revenue and ₹3.5L/month operating cost. The earlier ₹750/kg screen thresholds of approximately 1.9%, 4.9% and 7.9% remain the downside reference. None of these outputs is EBITDA, cash flow or a projection.

1,000 TPA gross output sensitivity

Feed case	Recovered Cu	Gross Cu revenue at ₹1,100–₹1,300/kg	Feed cost	Gross Cu less feed cost*
Low-Cu 0.8%	7.2 TPA	₹0.79–0.94cr	₹4.20cr	₹-3.41 to -3.26cr
Mixed 5.0%	45.0 TPA	₹4.95–5.85cr	₹4.20cr	₹0.75–1.65cr
Targeted 8.0%	72.0 TPA	₹7.92–9.36cr	₹4.20cr	₹3.72–5.16cr
High-Cu proxy 11.0%	99.0 TPA	₹10.89–12.87cr	₹4.20cr	₹6.69–8.67cr

* Gross copper less feed cost is before non-copper revenue, salaries, rent, power, logistics, residue, capex, working capital, interest, tax, assay and buyer deductions. It is not profit.

Interpretation

The new buyer indications materially improve the upside case, but they do not justify buying a full line immediately. The first investment remains a measured grade-and-payability test using the project's own output.

Copper benchmark and payability

Reference	Indicative value	What it is not
LME cash bid × CCIL reference	₹1,356.01/kg refined benchmark	Not a local scrap quote or guaranteed realization.
90% payability sensitivity	₹1,220.41/kg	Still excludes assay, moisture, freight, GST and buyer deductions.
80% payability sensitivity	₹1,084.81/kg	Requires buyer formula and product grade to be meaningful.
60% payability sensitivity	₹813.61/kg	Can be closer to a heavily discounted mixed-fraction outcome, but is not a quote.

Evidence note Benchmark from the validated price-sensitivity file. Obtain current buyer formulas and assay terms before using a copper price in a financing model.

Funding logic

- Promoter contribution should be sized against pilot loss capacity, deposits, compliance work and the first working-capital cycle, not only the machinery invoice.
- A term loan and CGTMSE-backed facility may be explored, but CGTMSE is a lender guarantee mechanism rather than a grant or viability approval.
- Do not include a 20% critical-mineral recycling subsidy in the base case; the validated research did not establish that a small dismantling unit qualifies.
- Keep Maharashtra incentives and EPR-linked income at zero in the lender case until current eligibility and registration are evidenced in writing.
- Do not reset the base case to ₹1,300/kg solely from phone conversations. Upgrade the price assumption only after two written buyer formulas and at least one paid trial lot.
- For investors, a tranche structure with release conditions is more appropriate than a single upfront equity cheque.

8 Risk register and mitigation

Risk	How it transmits to value	Early warning	Mitigation / gate
Low-copper feed	Lower output, negative contribution margin and excess residue.	Lot assays below threshold; mixed feed rising.	Lane contracts, one-tonne trials, purchase ceiling by grade.
Feed price inflation	Working capital and margin compress together.	Supplier price rises without grade improvement.	Formula pricing; service-fee alternatives; stop-buy thresholds.
Buyer payability / rejection	Revenue below benchmark; cash delayed.	Unwritten deductions or inconsistent assay.	Two written buyer formulas, counter-samples and reconciliation.
Working-capital shortfall	Cannot purchase feed or pay suppliers before buyer settlement.	Cash conversion exceeds 60 days.	Committed WC line, staged purchase and customer advances.
Permit / site failure	Lease and capex become stranded.	Landlord cannot provide permitted-use documents.	Plot-specific MPCB/fire/DISH/insurer diligence before lease.
Battery / fire event	Safety incident, shutdown, liability and insurance loss.	Loose cells, heat, damaged loads or overloaded storage.	Exclude from base feed; quarantine; training; fire design.
Data breach	Enterprise customer loss and liability.	Uncontrolled data-bearing equipment.	Access control, wiping/destruction SOP, certificates and audit.
Machine downtime	Throughput and customer service failure.	Used machine has no service history or spares.	Inspection, warranty, service SLA and manual fallback.
Buyer concentration	One buyer controls price and payment timing.	More than 50% of sales to one route.	Two or more active buyers by fraction and geography.
Unverified EPR / subsidy upside	Base case overstates revenue or funding.	Model depends on registration not yet obtained.	Set value to zero until written evidence.

Risk posture

The project has no single fatal flaw if capital is staged. It becomes high-risk when the promoter combines untested mixed feed, paid acquisition, long buyer cycles, loose batteries and irreversible machinery capex in one initial commitment.

9 90-day execution plan and decision rights

The first 90 days should be designed as an investment committee work program. Every activity must produce a document, a measurement or a signed term that can be audited.

Timing	Workstream	Deliverable	Decision owner
Days 0–15	Site and compliance	Two site screens; permitted-use, MPCB, fire, power, drainage, insurer and access memo.	Promoter + compliance advisor
Days 0–20	Partner route	Existing recycler MOU, current authorization, scope, custody and toll charges.	Promoter
Days 16–30	Supplier lanes	At least three supplier lanes with weights, category mix and price / fee terms.	Promoter + sourcing lead

Timing	Workstream	Deliverable	Decision owner
Days 16–30	Buyer validation	At least two written buyer formulas, grades, deductions and payment cycles.	Commercial lead
Days 31–60	Measured pilot	Four to six toll lots or a 100–300 TPA manual/stripper pilot with mass balance.	Operations lead
Days 45–70	Quality system	Lot ledger, sampling plan, grade codes, data destruction and battery quarantine SOPs.	Quality + EHS
Days 61–80	Financial close	Base/downside model, capex quotes, WC cycle, insurance and tax treatment.	Finance lead
Days 81–90	Investment committee	Go/no-go memo for Stage 2 with signed evidence pack.	Promoter + investors

Stage 2 go / no-go checklist

- Measured recovered copper and residue yields by supplier lane are within the commercial model's thresholds.
- At least two buyers provide written, executable payability formulas and payment terms.
- At least three supplier lanes can provide repeatable monthly volume with a documented grade or service-fee structure.
- The selected site has a plot-specific written compliance path and the lease permits the intended activity.
- Battery, hazardous, clinical and ELV boundaries are documented; downstream partners are verified.
- The 60-day working-capital requirement is funded or contractually committed, with downside headroom.
- Machine vendor quotes include installation, guarding, dust/fire controls, commissioning, warranty and spares.
- The base case remains viable after conservative copper payability, buyer deductions and delayed collections.

Stop condition

If any of the above is missing, keep the project in validation mode. Do not solve an evidence gap with a larger machine, a lower rent assumption or a more optimistic copper price.

10 Investor diligence checklist

The following pack should be assembled before any investor is asked to approve scale capital. The requested evidence is intentionally more demanding than a desktop feasibility report.

Workstream	Required evidence	Pass standard
Promoter and entity	KYC, incorporation, ownership, GST, Udyam, bank statements and existing liabilities.	Beneficial ownership and financial capacity are clear.
Site	Title / lease, permitted use, power load, fire design, drainage, access, landlord NOC and insurance screen.	No unresolved use or safety blocker.
Regulatory	MPCB and other applicable approvals, waste category mapping, battery/hazard route and downstream authorizations.	Written plot-specific pathway.
Supply	Supplier LOIs / contracts, monthly weights, category mix, pricing, service fee, pickup terms and EPR evidence.	Three lanes and a repeatable monthly plan.
Offtake	Buyer quotes, grade definitions, assay, payability, deductions, payment cycle and rejection terms.	Two active buyers with comparable formulas.
Operations	SOPs, staffing, training, lot ledger, data destruction, sampling, fire and incident response.	Auditable and executable at pilot scale.
Machinery	Three quotes, specification, throughput, power, guarding, warranty, service, spares and commissioning.	Total installed cost and uptime support are known.
Financial model	Base/downside/upside, capex, WC, tax, GST, insurance, freight, residue and debt service.	No unlabelled upside; sensitivities are transparent.

Workstream	Required evidence	Pass standard
Insurance and legal	Property, machinery breakdown, liability, workers compensation, environmental and contract review.	Coverage matches the actual waste and machinery risk.
Governance	Monthly MIS, bank controls, purchase limits, buyer concentration and approval matrix.	Investor can monitor and stop capital release.

Investor reporting pack after funding

- Weekly cash and inventory report during pilot.
- Monthly mass-balance dashboard by supplier lane and buyer fraction.
- Exception report for rejected loads, battery incidents, data-bearing custody and permit deviations.
- 13-week cash-flow forecast with feed purchases, buyer settlements and WC headroom.
- Quarterly compliance and insurance certificate check.

Appendix evidence posture and source register

The report uses the current validated local package as its source of truth. It distinguishes sourced facts, model estimates, proposed assumptions and unresolved diligence items.

Label	Meaning in this report	Examples
Verified / reported fact	A fact or conclusion transcribed from the validated package and its supporting files.	Existing screening tables, outreach counts, location comparison and policy notes.
Estimate	A derived figure from an explicit calculation or scenario range.	Working-capital float, capital envelope and copper-content thresholds.
Assumption	A proposed decision or planning input, not evidence of performance.	₹18.5–20L Stage 1 envelope and tranche structure.
Unknown	A material item not established by the current package.	Signed supply contracts, buyer payability sheets, audited accounts and actual commercial yield.

Primary local source files

Source file	Use in this memorandum
e_waste_metals_feasibility_report.docx / .pdf	Core business model, copper screen, regulation, market and risks.
e_waste_metals_under_recycled_outreach_addendum.docx / .pdf	Palghar comparison, supplier-channel feasibility, quality and hidden-cost research.
e_waste_machinery_premises_capital_compliance_report.docx / .pdf	Machinery, premises, pilot, capital and compliance scenarios.
e_waste_machinery_capital_scenarios.csv	Rent-heavy, used, new and hybrid capital ranges.
e_waste_pilot_scenarios.csv	Toll-test and sub-₹20L pilot options.
e_waste_working_capital_stress_test.csv	Feedstock-only float by capacity, price and payment cycle.
e_waste_copper_price_sensitivity.csv	Benchmark and payability sensitivity.
e_waste_buyer_price_indications.csv	Promoter-reported phone indications of ₹1,100/kg and ₹1,300/kg; not a contract or invoice.
e_waste_quality_platform_roadmap.md	Conditional Year 1 to Year 3+ quality-standardization and consolidation option.
e_waste_outreach_send_log.csv / tracker.csv	Market-validation activity; not a commitment pipeline.
e_waste_research_gap_register.csv	Open diligence gaps and evidence boundaries.

Evidence note Source package dates: evidence cut-off 20–24 August 2026. Report date: 8 September 2026. Current market quotes, laws, regulations and buyer terms must be refreshed before execution.

Published site

[Open the validated Maharashtra feasibility site](#)

The Site opens the broader feasibility research package; this memorandum is the investor-oriented synthesis.

Final investment view

Proceed with Stage 0/Stage 1 validation. Move to scale only after grade, recovery, permits, buyer payability and working-capital evidence are proven.