NEO SEEKER METALS

Sustainable Extraction of Critical and Precious metals from E-Waste and Li-ion Batteries

www.neoseekermetals.com

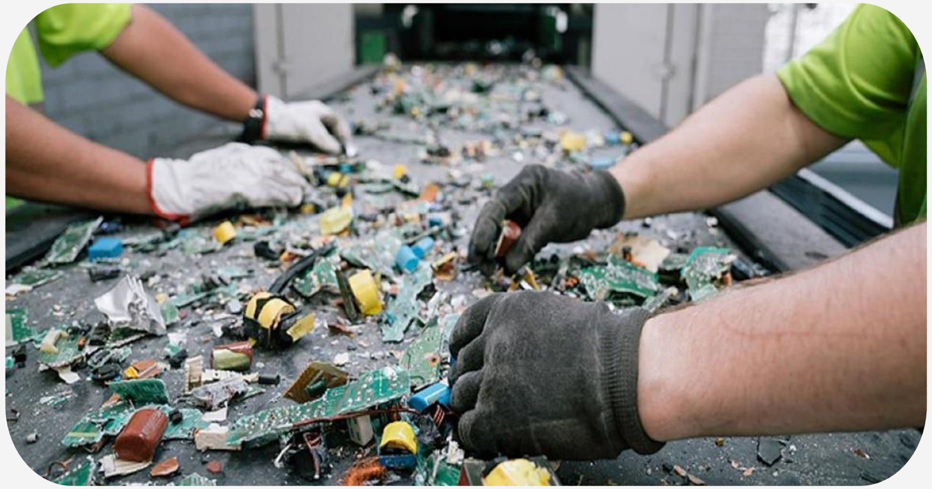
Investor Memorandum – July 2025

About Us

Neo-Seekermetals Private Limited (NSPL)

is a sustainability-driven metallurgical technology company focused on recycling battery waste and electronic waste to recover high-value critical and precious metals in **single process**. Founded in 2023 and headquartered in Hyderabad, NSPL has developed a PATENTED (LiBERT) process that enables the recovery of metals such as lithium, cobalt, copper, nickel, manganese, and gold, with significantly lower environmental impact compared to conventional methods.

With patented innovation and a focus on circular economy principles, we aim to become a leader in India’s clean-tech and critical minerals space.



VISION

To be a global leader in sustainable metal recovery from battery and e-waste, enabling a circular and low-carbon future.

MISSION

To recover critical metals from e-waste and battery waste using eco-friendly, efficient, and innovative recycling technologies.

Our Team

Shaik Saida CO FOUNDER & Director

Metallurgist Extractive metallurgy expert, patent holder, and IIT Kharagpur scholar.

Geetha Reddy CO FOUNDER & Director

Visionary entrepreneur with 20+ years of driving business growth and creating meaningful impact through philanthropy.

Naveen Karri CO FOUNDER & Director

Leads renewable energy and waste management, IIT Kharagpur alumnus and electrical engineer.

Dr. Chenna Rao Borra Asst Professor (IIT Kharagpur)

Professor at IIT Kharagpur, expert in mineral processing and waste utilization with 15+ years’ experience.

Mr. Christ Vase Director- Business Transformation

23+ years experience in Financial Services.

Our Milestones

July 2023

Company inception

November 2023

- Technology transfer from IIT Kharagpur
- MVP trials initiated

April 2024

- Pilot lab setup completed
- Pilot scale development executed
- Plant design and equipment finalization
- Technology optimization

December 2024

- Land allotment received from government
- Process optimization initiated

February 2025

- Government approvals secured for full plant construction
- Construction officially started

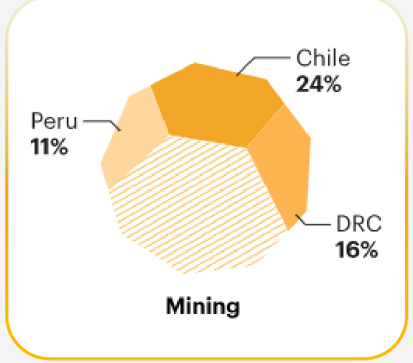
June 2025

Product validation at ARCI incubation center

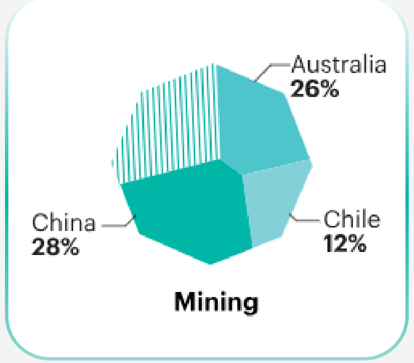
Why Recycling Critical Minerals Matters for India

India's growing EV and energy storage sectors rely heavily on imported lithium, cobalt, and nickel due to limited domestic reserves, creating supply risks. To reduce dependence and ensure sustainability, the government is promoting recycling of discarded electronics and batteries to recover these critical minerals to secure resources while cutting environmental impact.

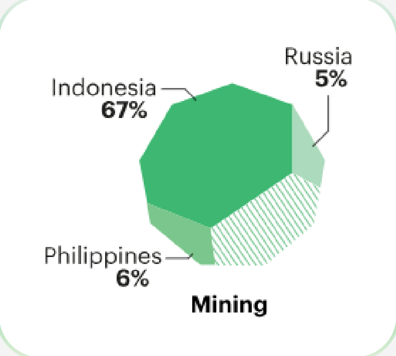
Copper



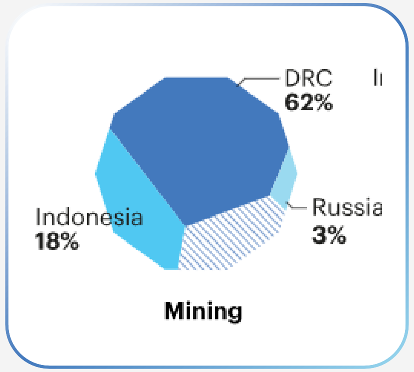
Lithium



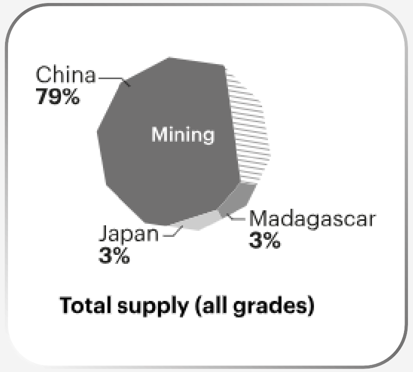
Nickel



Cobalt



Graphite



***Source :** Sector reports, Media articles, Industry sources, Company filings, Fund house reports

List of Critical Minerals Recognized by Indian Govt. in 2025

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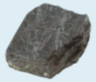
1. Antimony
2. Beryllium
3. Bismuth
4. Cadmium
5. Cobalt
6. Copper
7. Gallium
8. Germanium
9. Graphite
10. Hafnium
11. Indium
12. Lithium
13. Molybdenum
14. Niobium
15. Nickel
16. PGE
    - i. Platinum
    - ii. Palladium
    - iii. Rhodium
    - iv. Ruthenium
    - v. Iridium
    - vi. Osmium
17. Phosphorous
18. Potash
19. REE
    - i. Lanthanum
    - ii. Cerium
    - iii. Praseodymium
    - iv. Neodymium
    - v. Promethium
    - vi. Samarium
    - vii. Europium
    - viii. Gadolinium
    - ix. Terbium
    - x. Dysprosium
    - xi. Holmium
    - xii. Erbium
    - xiii. Thulium
    - xiv. Ytterbium
    - xv. Lutetium
    - xvi. Scandium
    - xvii. Yttrium
20. Rhenium
21. Selenium
22. Silicon
23. Strontium
24. Tantalum
25. Tellurium
26. Tin
27. Titanium
28. Tungsten
29. Vanadium
30. Zirconium

Metals Targeted by Neo Seekermetals


Cobalt


Copper

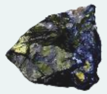

Graphite


Lithium


Nickel


PGE

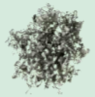
I. Platinum
II. Palladium
III. Rhodium
IV. Ruthenium
V. Iridium
VI. Osmium


Tin


Gold


Silver


Lead


Manganese

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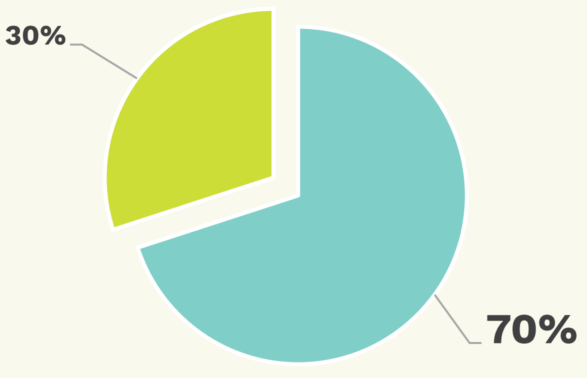
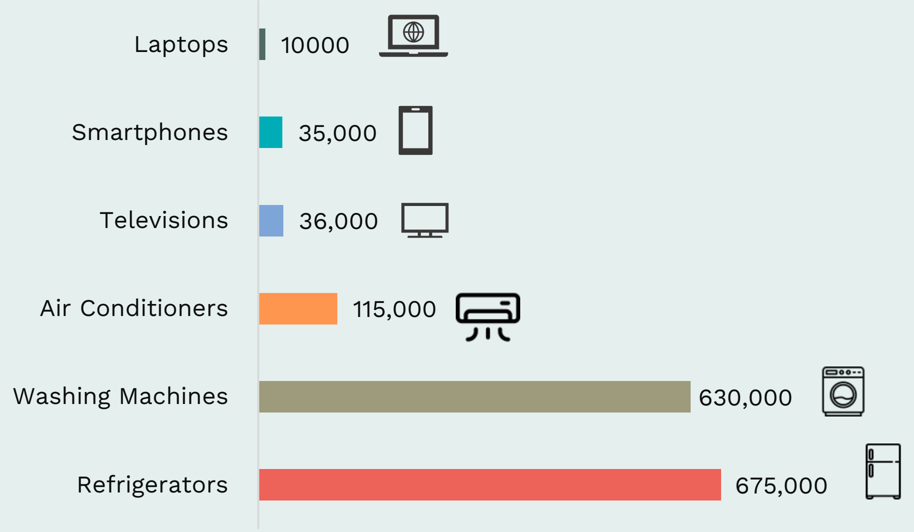
Types of Waste available for recycling

E-waste in India is primarily generated through two channels

E waste Sources in India



Household E Waste breakdown (in Tonnes)

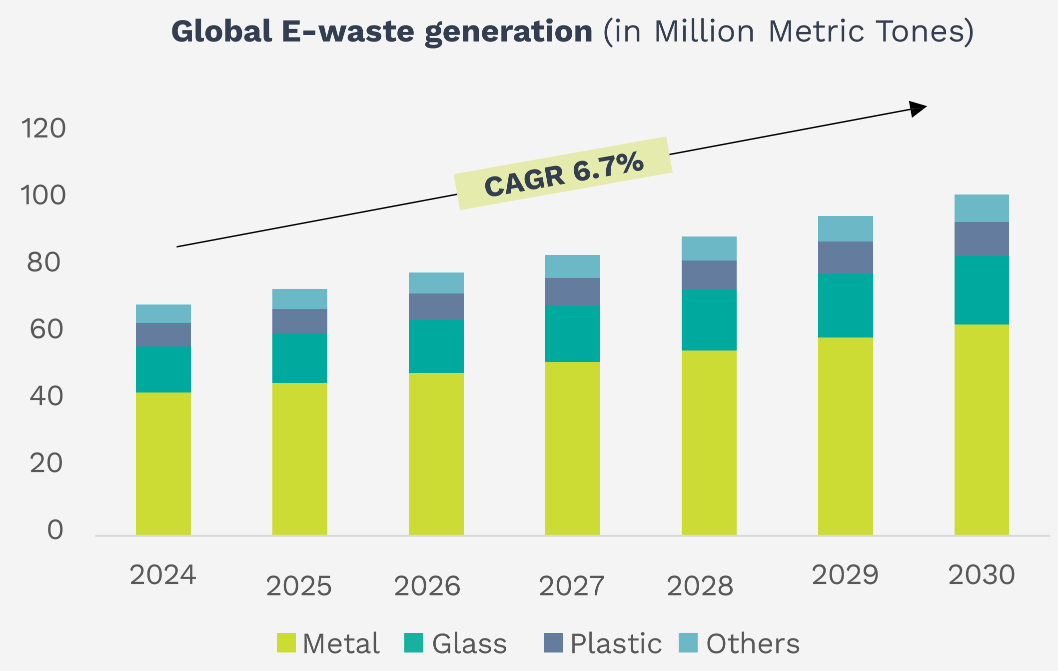


India generates 2.5 MMT of e-waste annually, with large appliances (1.2 MMT) and temperature exchange equipment like ACs/refrigerators (1.3 MMT) being major contributors. The remaining 30% comes from diverse business equipment including cooling systems, office electronics, commercial appliances, and specialized medical/lab devices..

- Printed Circuit Boards (PCBs) are the backbone of most electrical and electronic equipment (EEE), enabling control, data flow, and functionality.
- They are also among the most valuable components for recycling, as they contain precious metals like gold, silver, palladium, copper, and rare earth elements.
- Devices such as mobile phones, laptops, desktops, televisions, routers, printers, medical instruments, and industrial electronics are key sources of PCB waste.
- In fact, PCBs contribute to over 60% of the total economic value recoverable from e-waste, making them a critical material stream for India's circular economy.

***Source :** Sector reports, Media articles, Industry sources, Company filings, Fund house reports

E-waste Market Scope



347 Mt
Unrecycled e-waste on Earth in 2025.

78% E-waste
E-waste goes uncollected or is mismanaged

Only 22.3% E-waste
Formally collected and recycled

3.2 Million tons
Generates e-waste annually

Explosive Growth :

India ranks as **the 3rd largest e-waste generator** globally, with waste volumes increasing 151% from 2017–18 to 2023–24. However, only 5% is recycled, while 60% is dumped in warehouses, highlighting a severe waste management gap.

Drivers of Accumulation:

Factors include rising electronic production (USD 100 billion in 2022–23), increased digitalization, and shorter device lifecycles. India now produces 3% of global EEE and is expected to reach 920 million IT-enabled products annually by 2028.

Economic Potential:

E-waste contains precious (gold, silver, palladium), strategic (lithium, cobalt), and base metals (copper, nickel)—worth USD 2.5 billion. Yet, India recovers only 1.4g gold per tonne. Strengthening recycling infrastructure and EPR policies can unlock both economic and sustainability value.

Printed Circuit Boards (PCBs):

PCBs account for only 3% of e-waste by weight but over 40% of its recoverable metal value. They are rich in gold, copper, palladium, and rare earths, making them a high-priority target for advanced recycling technologies and investment.

***Source :** Sector reports, Media articles, Industry sources, Company filings, Fund house reports

Battery Waste is Growing — Recycling is the Solution

Every year over
15 BILLION
batteries are purchased worldwide.

Which is about 180,000 tons of batteries.
That's 1,500 times as heavy as a Blue Whale!

Batteries contain corrosive materials and heavy metals that can contaminate the environment.

Zinc | Steel | Manganese

These metals can be recycled for use in other applications.

DID YOU KNOW?

Rechargeable batteries are less harmful to the environment because they reduce the total number of batteries manufactured and entering the waste stream.

Different types of batteries to recycle:

- Alkaline
- Button
- Lithium
- Lead-Acid

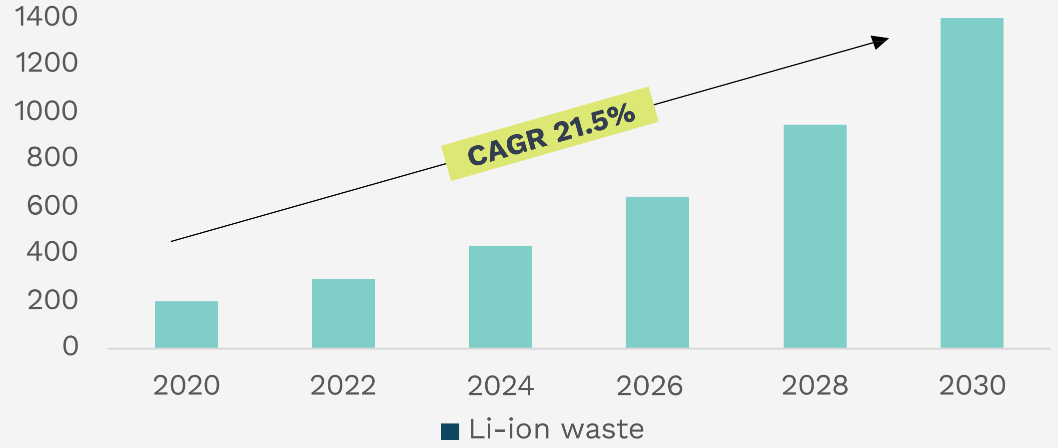
The importance of recycling batteries:

- Recycled batteries can be reused to make new products
- Recycled batteries mean less materials going into landfills
- Recycled batteries conserve natural resources
- Recycled materials can be used to produce energy

***Source :** Sector reports, Media articles, Industry sources, Company filings, Fund house reports

LiB-waste Market Scope

Global Li-ion waste generation
(in Thousand Metric Tones)



2,000 GWH Globally	**$193.13B** Li-ion Battery Market
140M EVs	**10X** Growth Rate

India's demand for lithium-ion batteries (LiBs) is expected to surge to **115 Gigawatt-hours** (GWh) by 2030.

Recycling capacity is expected to scale up, exceeding 50% by 2030

Sources of LiB Waste

Small Electronics (>80%)

- Laptops
- Smartphones
- Tablets
- Cameras
- Bluetooth accessories

Typical lifespan: **2–3 years**

Large Batteries (<20%)

- Electric vehicles
- Energy storage systems

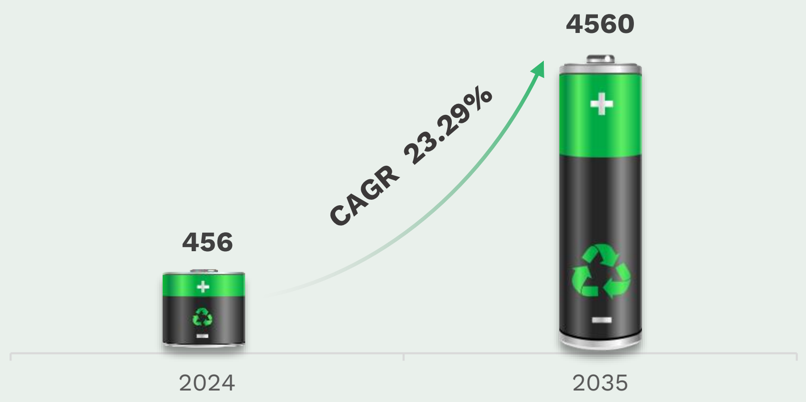
Typical lifespan: **5–10 years**

*Source : Sector reports, Media articles, Industry sources, Company filings, Fund house reports

Recycling Market Scope

Indian E Waste Recycling (USD Billion)

India Li-Ion Battery Recycling (USD Million)



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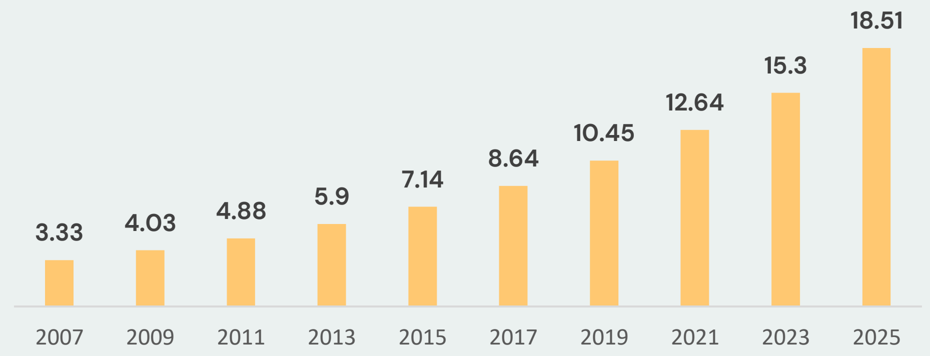
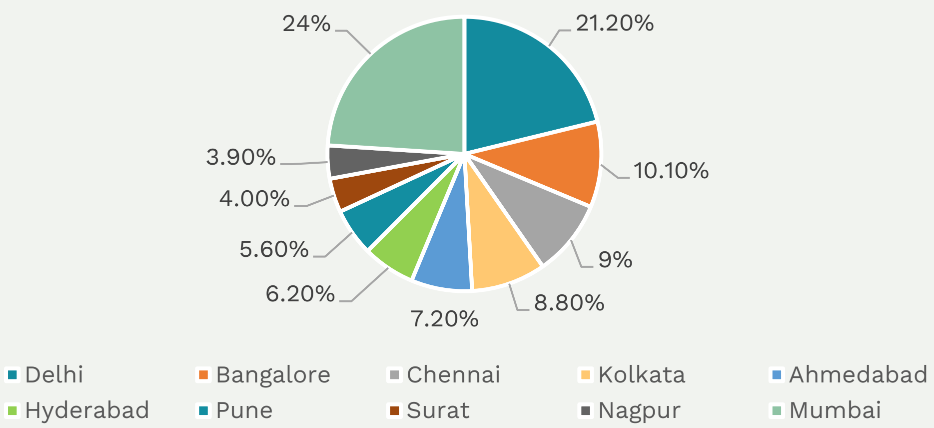
Growth of E-waste Generation in India (in Lakh Metric Tonnes)

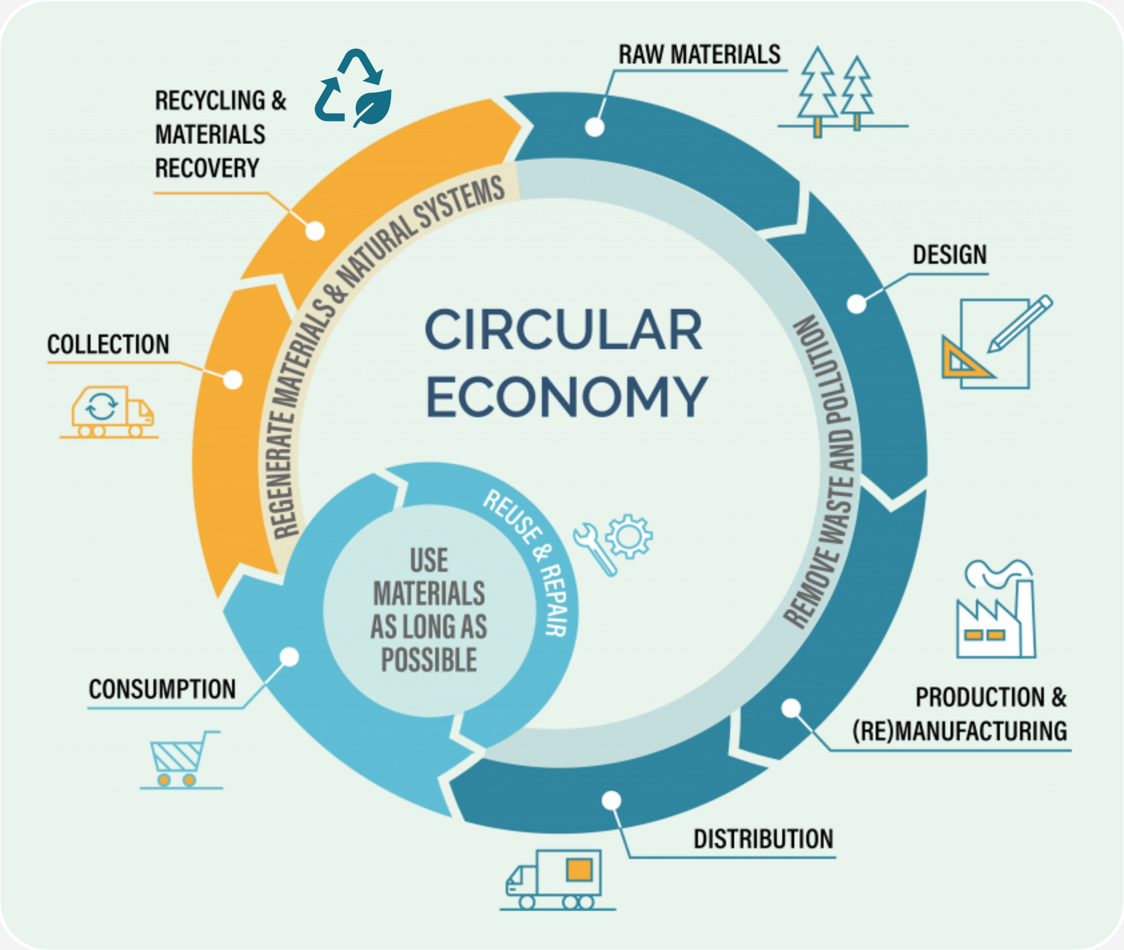


City wise E-waste Generation in India(Tonnes/year)



Government Push for E-Waste & Battery Waste Recycling in India

India is aggressively enabling a transition to a circular economy with targeted reforms and financial incentives aimed at unlocking the full potential of the e-waste and battery recycling sector. These policy moves not only support environmental goals but also provide a predictable and profitable policy environment for private investors.



- **₹1,500 crore** allocated in Budget 2025 to develop e-waste and battery recycling infrastructure.
- **100% customs duty exemption** on lithium-ion battery scrap and critical raw materials to lower recycling costs.
- Battery Waste Management Rules (2022) **mandate 90% recycling** of battery materials by 2026.
- 20% of recycled materials must be reused in new batteries by 2030 to promote circular economy.
- **PLI scheme of USD 2.16 billion** launched to boost domestic LiB manufacturing and reduce import dependency.
- **₹16,300 crore** National Critical Mineral Mission launched to ensure mineral self-reliance for green technologies. **₹34,300 crore over 7 years**, including ₹18,000 crore from public sector enterprises.
- 35 EV battery manufacturing goods exempted from customs duty, supporting Make in India for clean energy.
- Global LiB waste expected to hit **464,000 tons by 2025**, with India emerging as a major contributor due to rising EV and electronics adoption.

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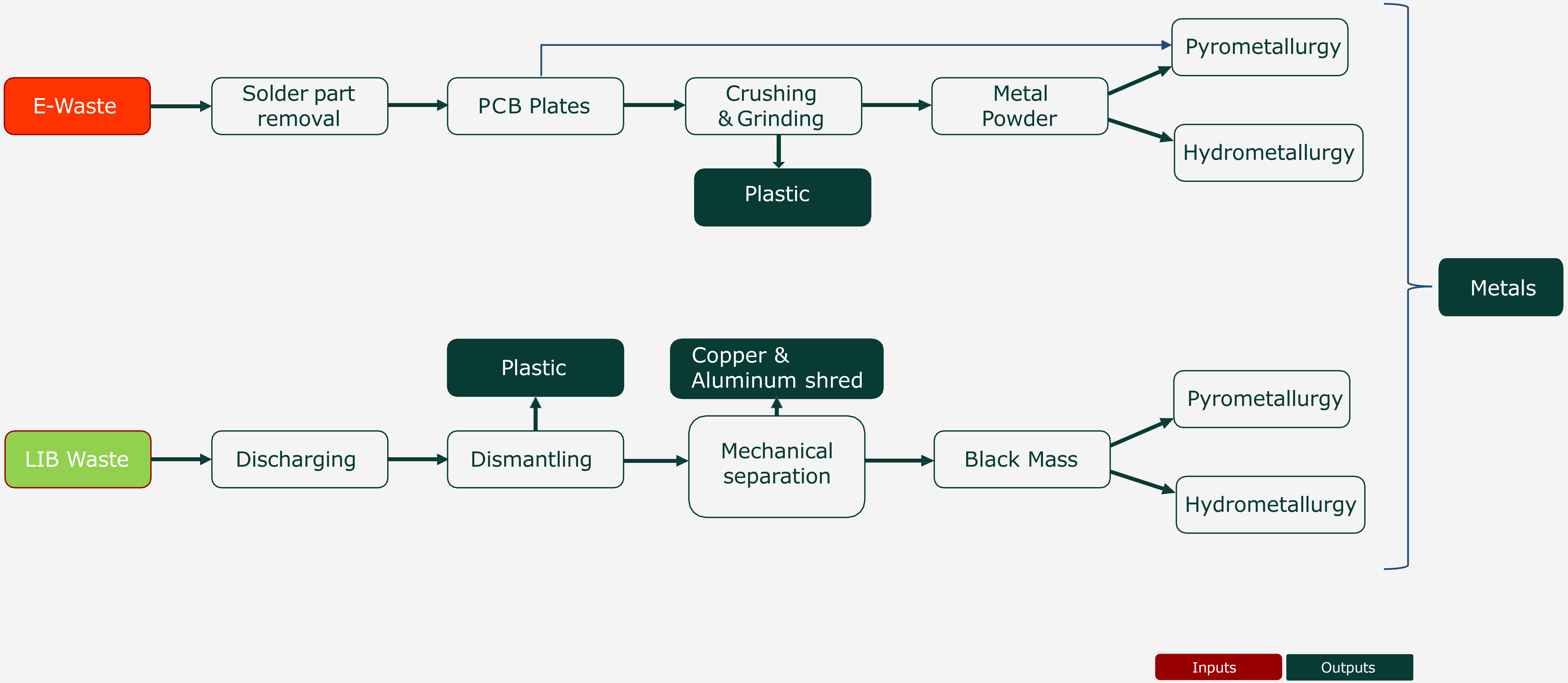
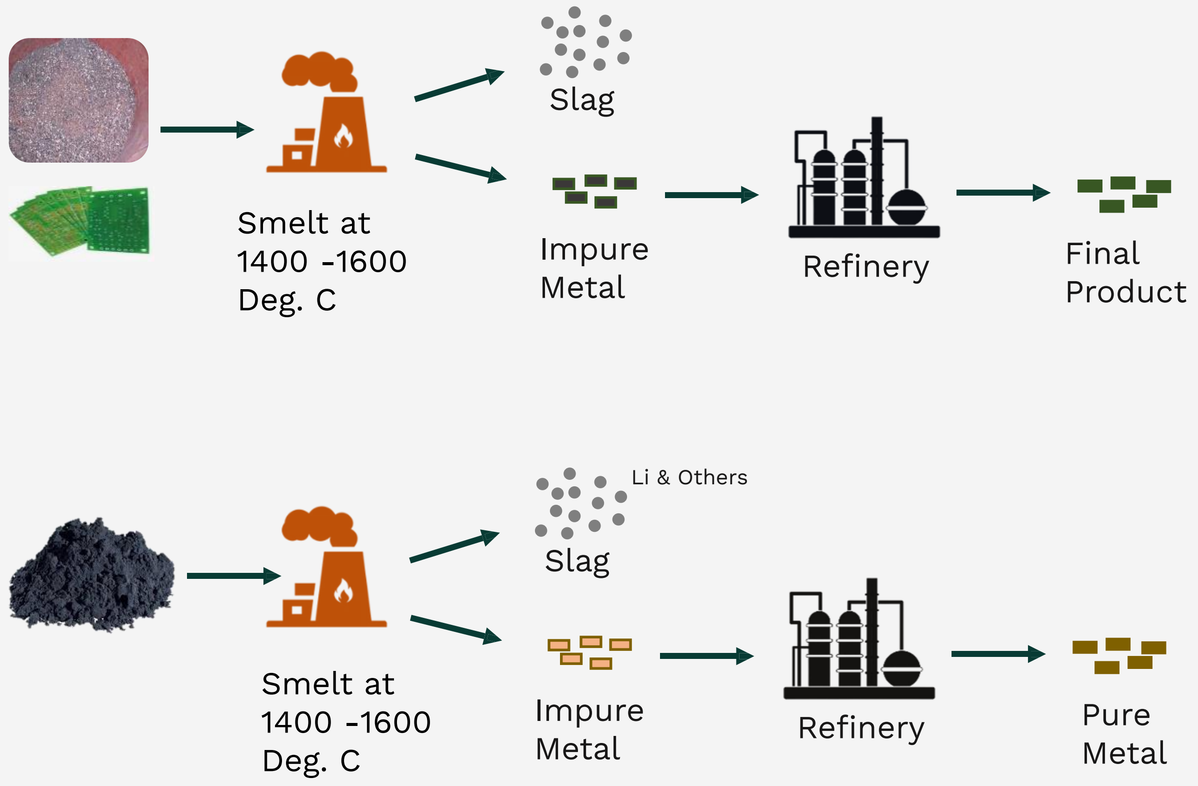
Existing Technology: Conventional way of recycling

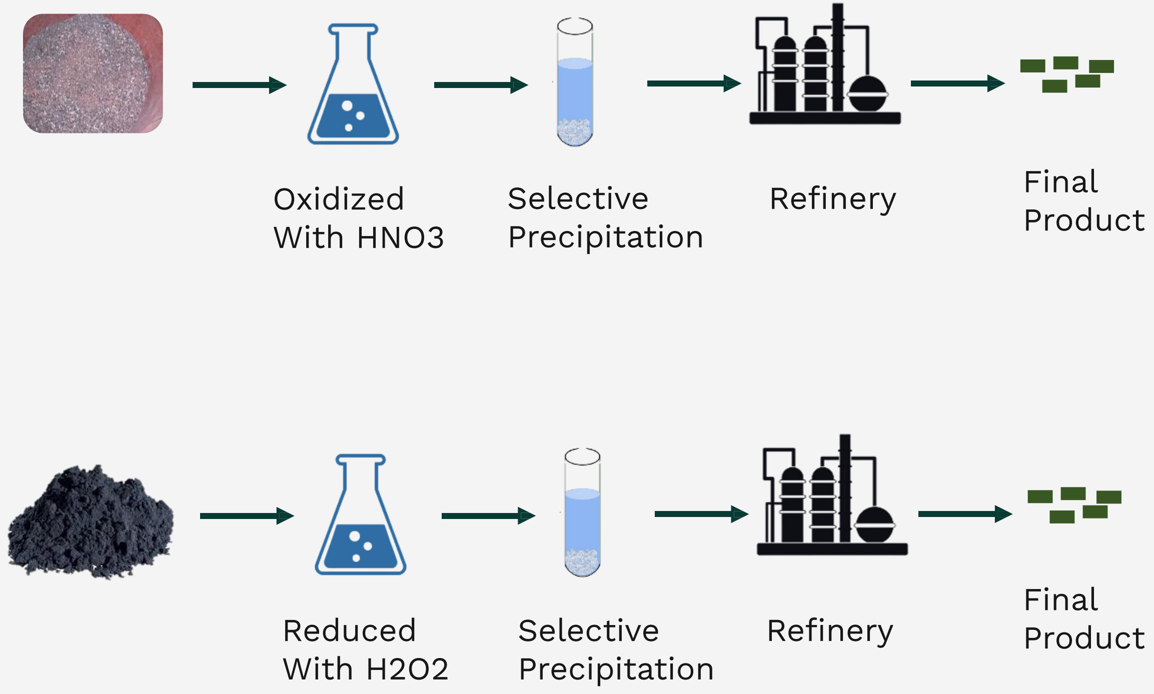


Current Recycling Solutions

Currently the following solutions are available:



Pyrometallurgical Process



Hydrometallurgical Process

Challenges in Current Recycling Solutions

The existing solutions are inadequate to tackle the scale and complexity of the Li-ion and E-waste problem

Process routes for battery and PCB recycling need heavy **Capex and operation cost**

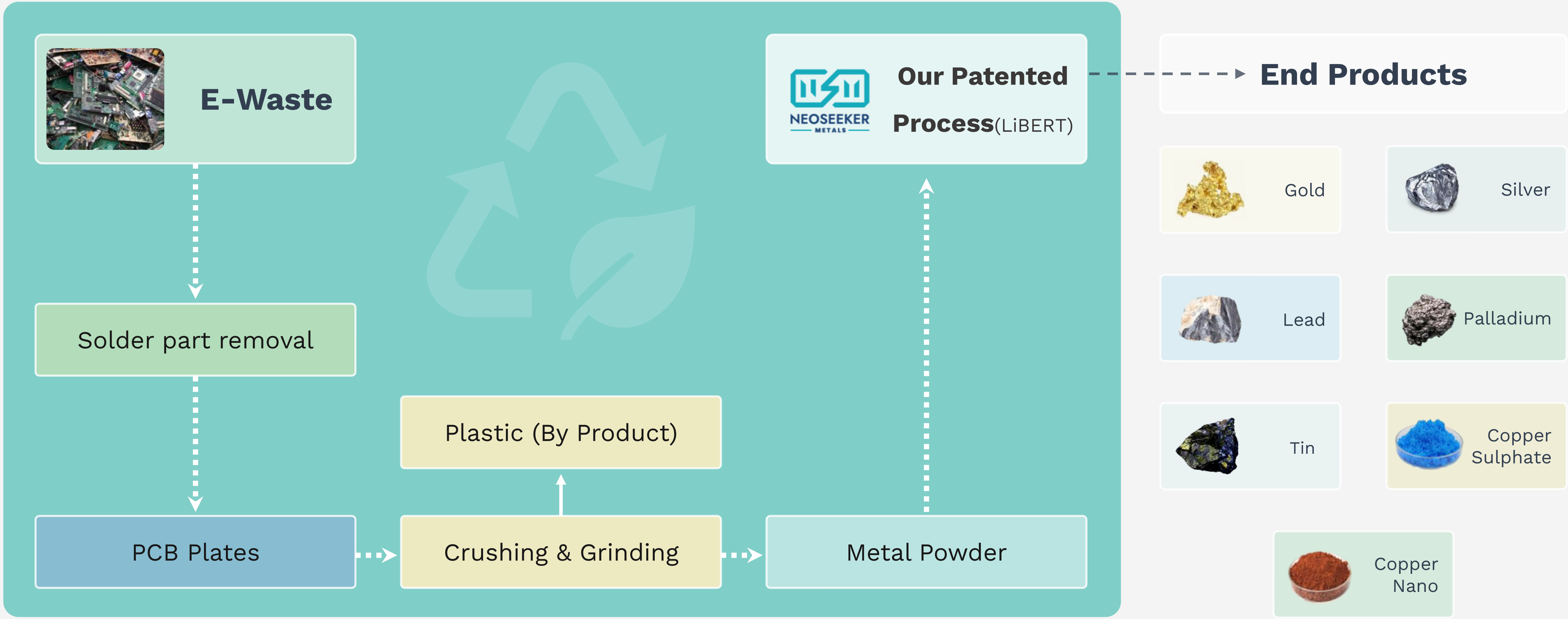
Hydro processes for PCB recycling release extremely harmful **NoX gases or need strong oxidizers**

Heavy non-recyclable chemicals are used in the process, which need costly discharge treatment

Pyro Processes are capital intensive, not viable at scale lower than **10000 Ton/Annum**

The existing technologies are **extremely energy and capital intensive**

Our Patented Process (LiBERT)



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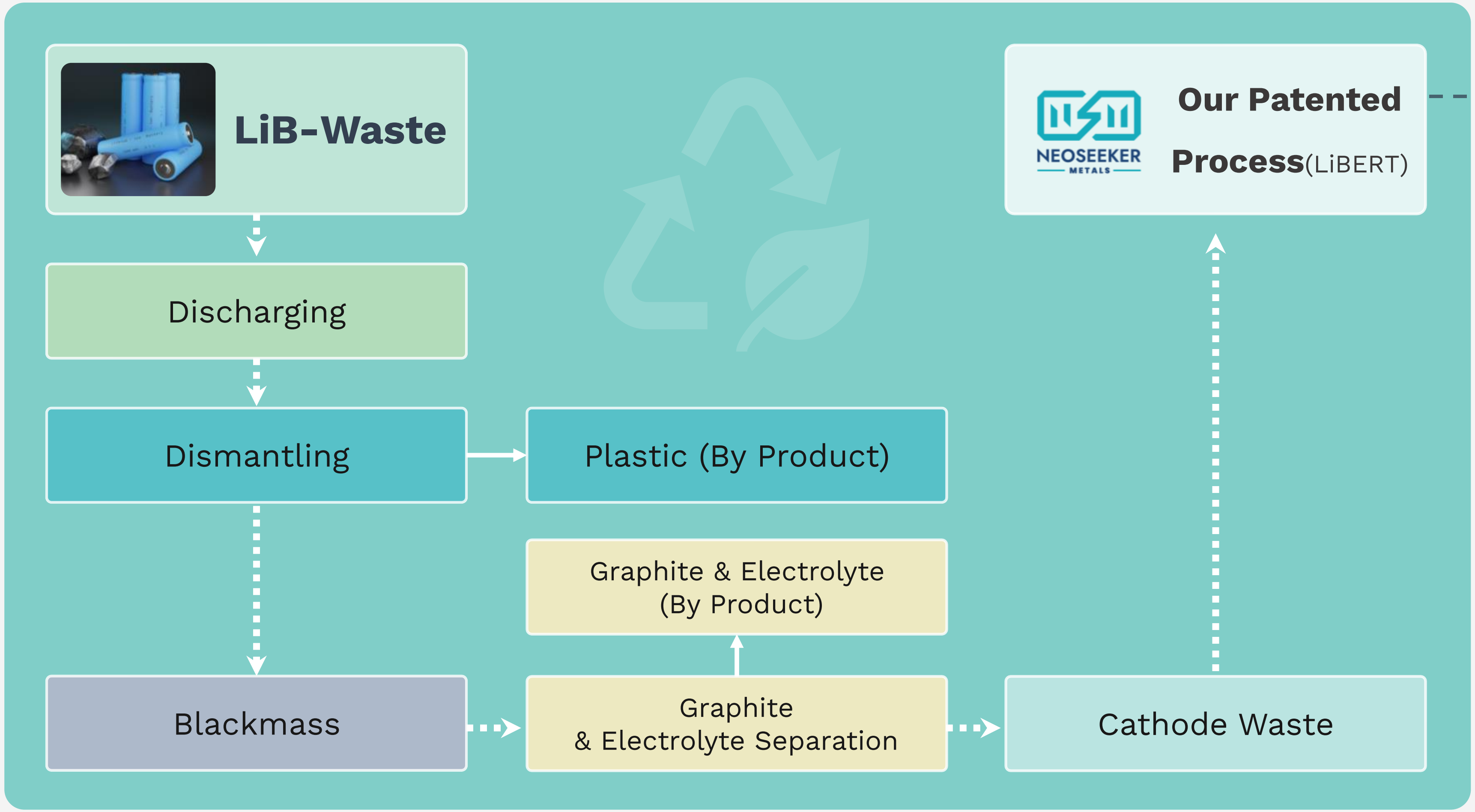


End Products

- Cobalt sulphate
- Lithium carbonate
- MMO (Cathode Precursor)
- Graphite
- Electrolyte
- Hi-pure Alumina

How LiBERT Works

Single-Stream Process Integration

Unlike conventional recyclers that treat lithium-ion batteries and e-waste separately, LiBERT integrates both into a single hydrometallurgical flow, which:

- Reduces processing complexity
- Improves metal recovery efficiency
- Reduces the number of steps and environmental impact

Energy and CO2 Emissions

Energy Consumption

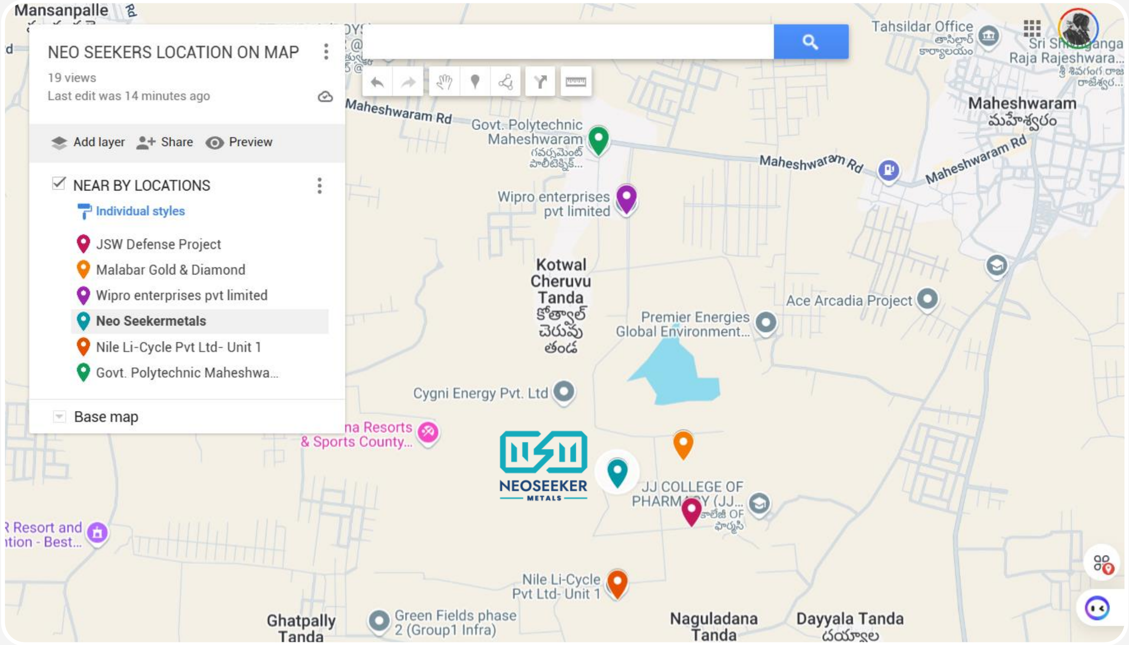
Our Process	Hydrometallurgy	Pyrometallurgy	Pyro+ Hydro	Mining
28%	75%	66%	47%	100%

CO2 Emissions

Our Process	Hydrometallurgy	Pyrometallurgy	Pyro+ Hydro	Mining
11%	70%	90%	40%	100%

Place and Location Advantage

- Plant is situated in EMC Maheswaram, Telangana
- Central to major IT hubs of southern India (with in 650 Km radius)
- 20 Km from international Airport
- 600 Km from international ports
- Good road connectivity with national Highways
- Closer to plastic industrial park (10 Km)
- 3 Gold refineries in walkable distance



Neoseekers is establishing a state-of-the-art recycling facility that enables the recovery of critical metals from both lithium-ion batteries and electronic waste through a single, unified and highly efficient process.

1 Acre (43,560 Sq Ft) **Built up Area** (14,500 Sq Ft)

Daily Capacity

E - Waste	LiB- Waste
8,000 Kgs	**4,600** Kgs

THANK YOU

EMAIL

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