



e-Waste Management, Recycling & Resource Generation

Effective Collection

| **P**rogressive Recycling

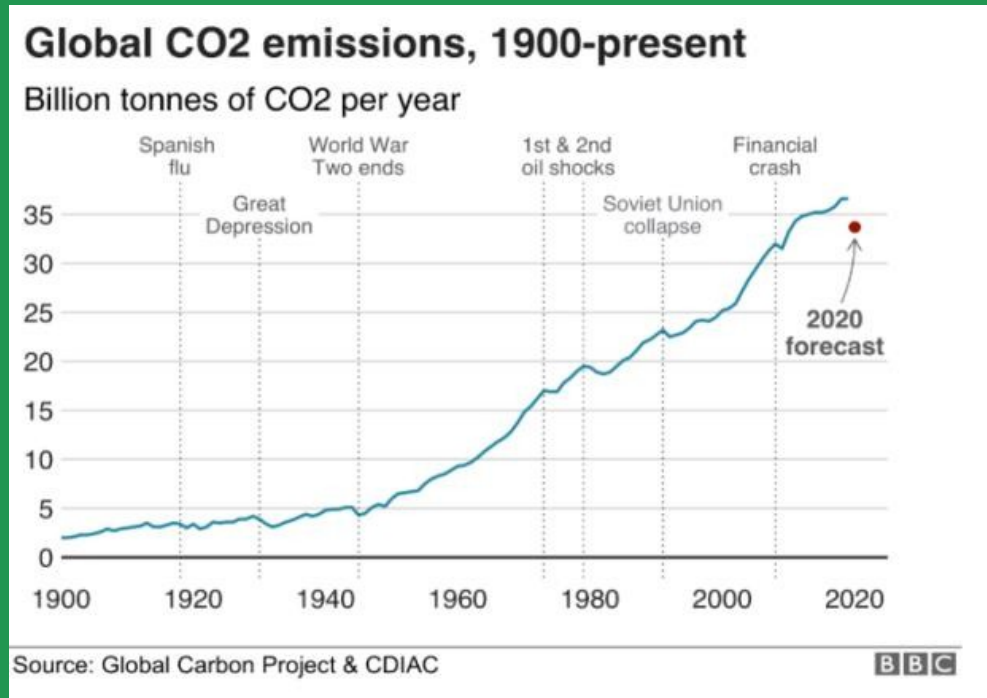
| **R**educing Emissions



Material Shortage & Climate Change

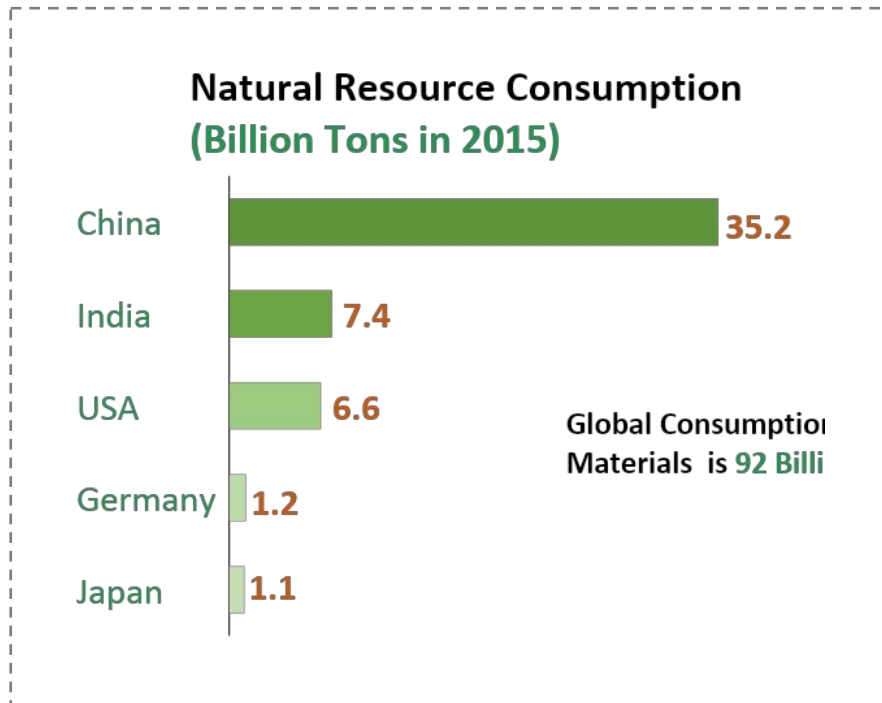
Technology Chip Shortage Spirals Beyond Cars to Phones and Consoles

By [Debby Wu](#), [Vlad Savov](#), and [Takashi Mochizuki](#)
 February 6, 2021, 1:30 AM GMT+5:30 Updated on February 8, 2021, 7:01 AM GMT+5:30



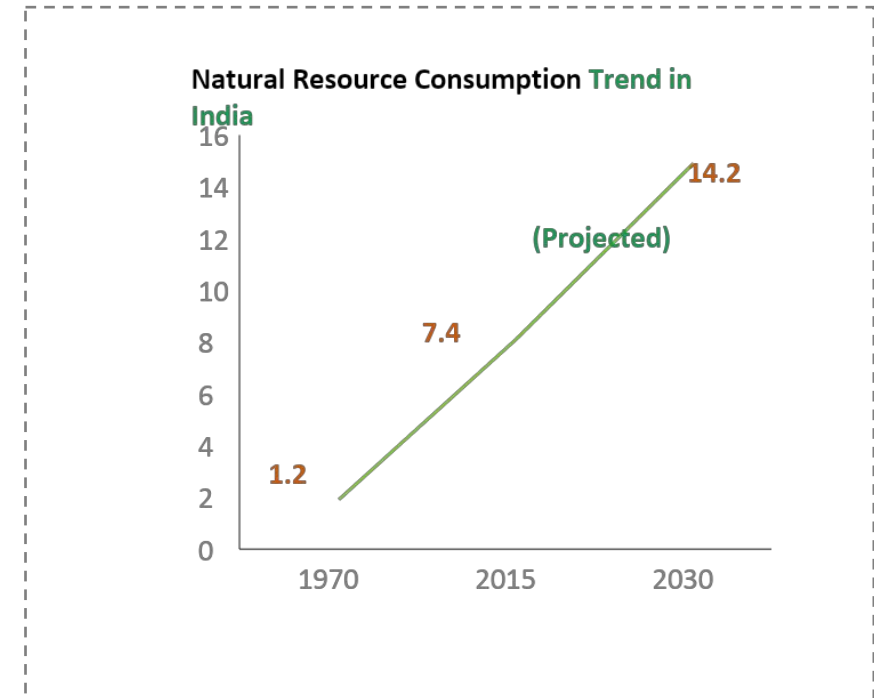
Rapid Depletion of Natural Resources

- Recycling Rate in developed countries
- 50% in EU



Recycling rate(India) :

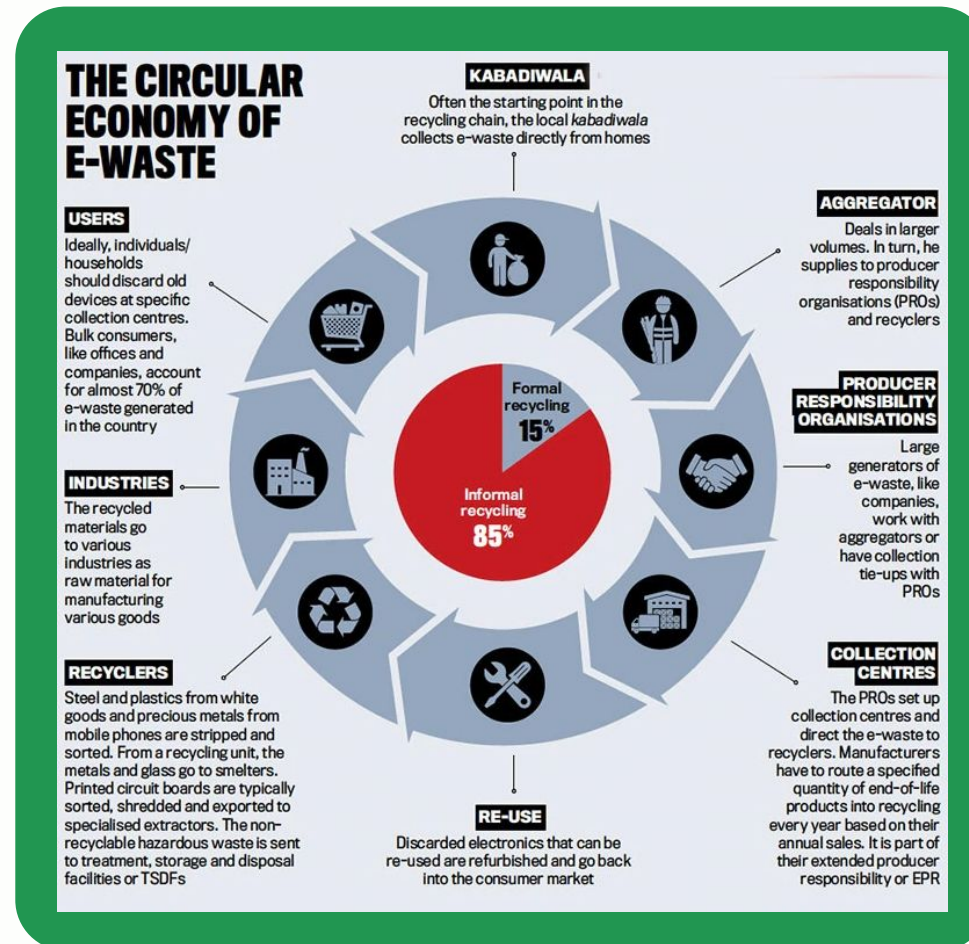
30% High import dependency on many critical raw materials such as Nickel, Cobalt, Molybdenum, Copper, and oil).



Challenges in the E-Waste Industry

More than **95%** of customers refuse to give their EOL products at no cost

The formal collection is **20%**, **10%** Bulk consumers & **70%** informal sector



More than **70%** of E-Waste is collected & recycled by informal sectors

Informal sector collects **20%** of e-Waste from retailers & **50%** from individuals

E-waste Generation

E-waste generated worldwide: 53 Million metric Tonnes valued at approx 60 Billion USD is projected to rise to \$119 Billion USD by 2027.

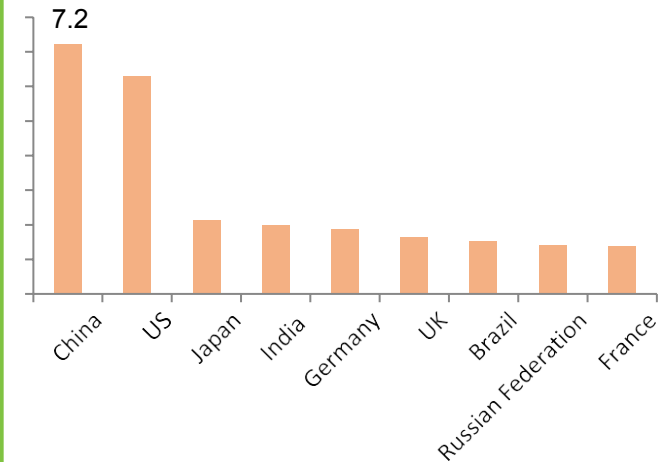
Globally only 20% of e-Waste is collected & recycled properly vs shortages of materials across the globe, automobile sector facing serious challenges due to the unavailability of semiconductors.

E-Waste generated in India in 2017-18 was 708445 tonnes & 2018-19 e-Waste generation was 771215 tonnes, and 2019-2020 generation was 1014961.2 tonnes.

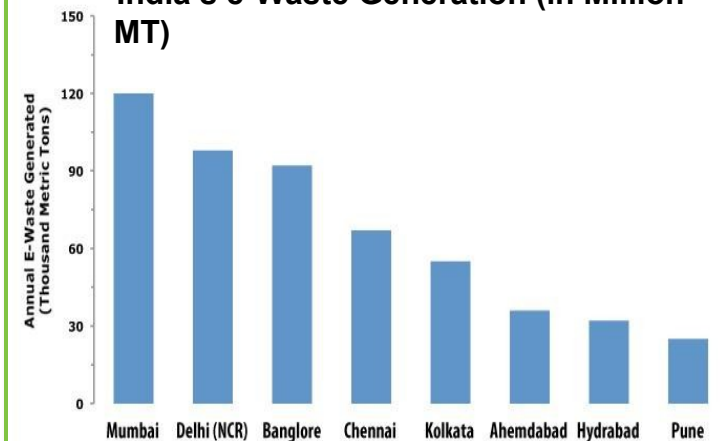
E-waste is estimated to grow at a **CAGR of 14.1%** (2020-2027) globally.

Source: global e-waste monitor & allied market research, Pollution Control Board.

Global E-waste Generation (in Million MT)



India's e-Waste Generation (in Million MT)



E-waste or An E-treasure

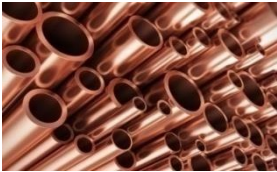
“E-Waste is an Urban Mine”

E-waste contains 69 elements from the periodic table & various precious metals like gold, silver, platinum, and rare earth metals like neodymium & praseodymium with unique magnetic and electronic properties that evade our modern lives, renewable energy depend on them that make them even more imperative to recover from secondary ores.

Commodities found in E-Waste



Plastics 27 %

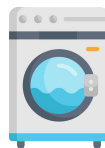
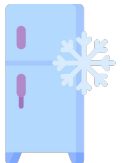
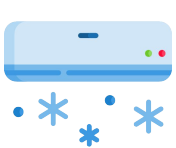


Metals 53 %

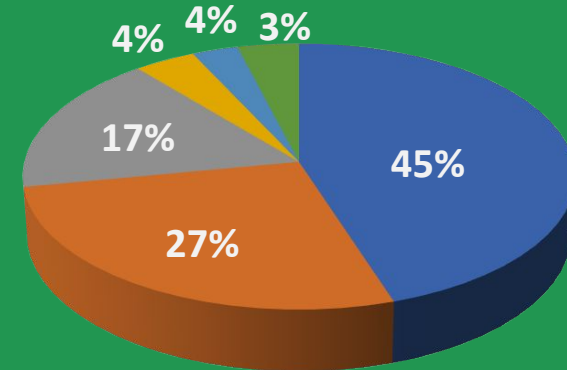


Glass & others
20%

Sources of E-Waste



Materials found in E-waste



Iron



Plastic



Glass



Aluminium



Copper



Others



Critical Materials For India

- Notification issued by Government of India wherein Antimony, Beryllium, Bismuth, Cobalt, Copper, & many others metals are **highly critical materials** for the nation
- In 3-5 years a mechanism to digitally track the use of critical materials in India and their supply from e-Waste can be established
- To generate secondary raw materials recycling must be encouraged and promotion of eco-labelling of green products for consumers to make conscious decisions
- Awareness and demand for circular consumption supported by improved availability of recycled products in the market



Every Home is An Urban Mine

Average Urban Household has the following electronic appliances:

- 2-4 types of Household appliances
- 5-6 types of Small Appliances
- 4 to 5 Small gadgets
- 2-5 types of IT Products
- Multiple LED Lamps and Bulbs



Kitchen

- Small Appliances
- Dish Washer
- Chimney systems
- Microwaves



The Study & Hobby

- Air-Conditioners
- Computers /Laptop
- Camera's / Tabs
- LED lamps
- Ceiling Fans



Living Room

- Air-Conditioners
- Television / Set top box
- Home Theatre
- LED lamps
- Ceiling Fans
- Remote controller



Bedroom

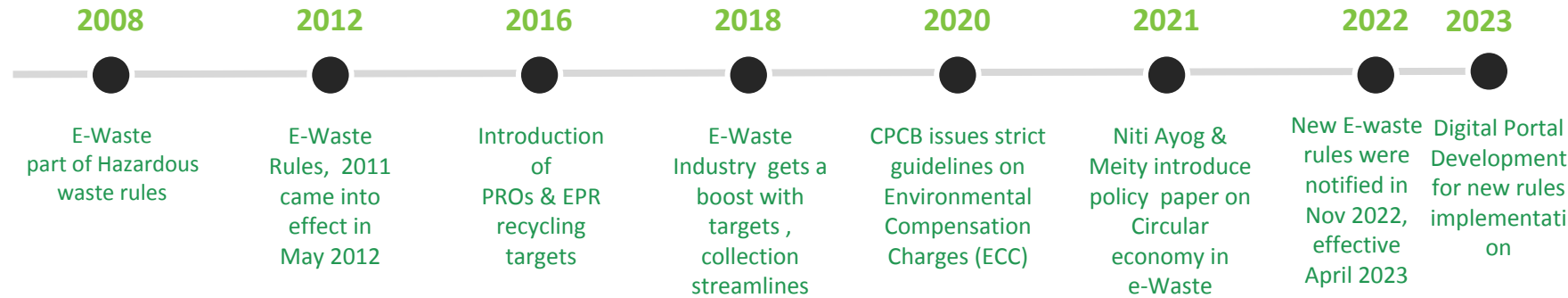
- Television
- Fans
- Remotes
- LED Lights
- Ceiling fans
- AC



Bathroom & Household

- Electric Heater
- Washing machine
- LED Lamps
- Electric Shavers

E-waste Rules so Far



EWM Rules, 2022 Key Additions:

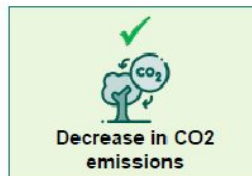
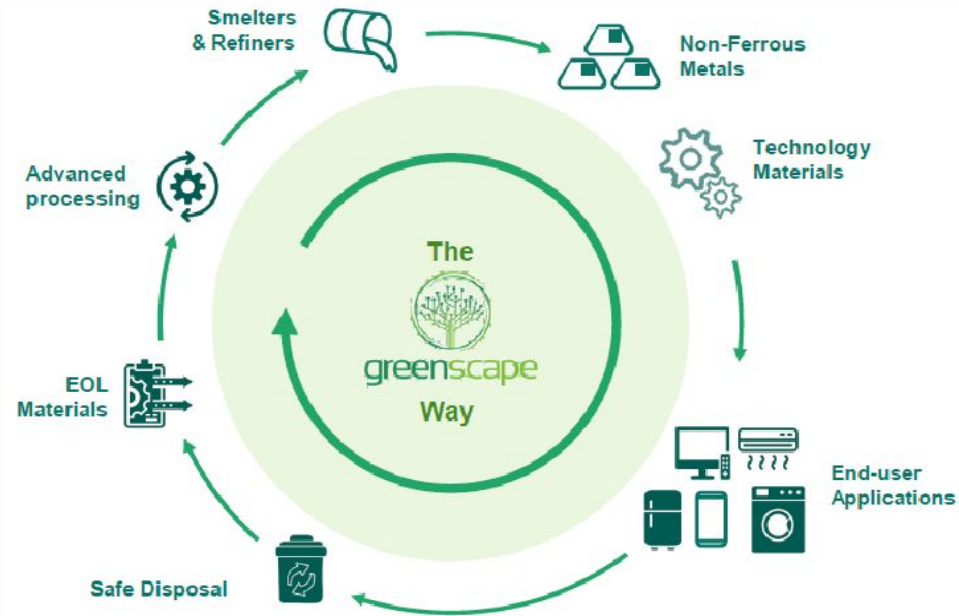
- Introduction of Environmental Compensation Charges (ECC)
- **74+ New categories**
- Introduction of steering committee
- Digitization of EPR compliance, e-certificates via CPCB portal
- Emphasis on commodities sales

- India has been frontrunner in adapting the e-waste rules in APAC region
- CPCB currently working on digitization of e-waste collection & recycling data to promote transparency & strict implementation of rules
- Introduction of EPR & recycling targets has boosted the e-Waste sector in India, 40 + Organizations and 300+ authorized dismantlers & recyclers, more global and organized players seen
- Collection & channelization of e-Waste to organized players has increased significantly
- Latest E-waste Rules 2022 introduced which will strengthen advanced recycling

Circular Revolution is Inevitable

Necessitating an Urgent Need for a Mining Revolution, The Greenscape Way

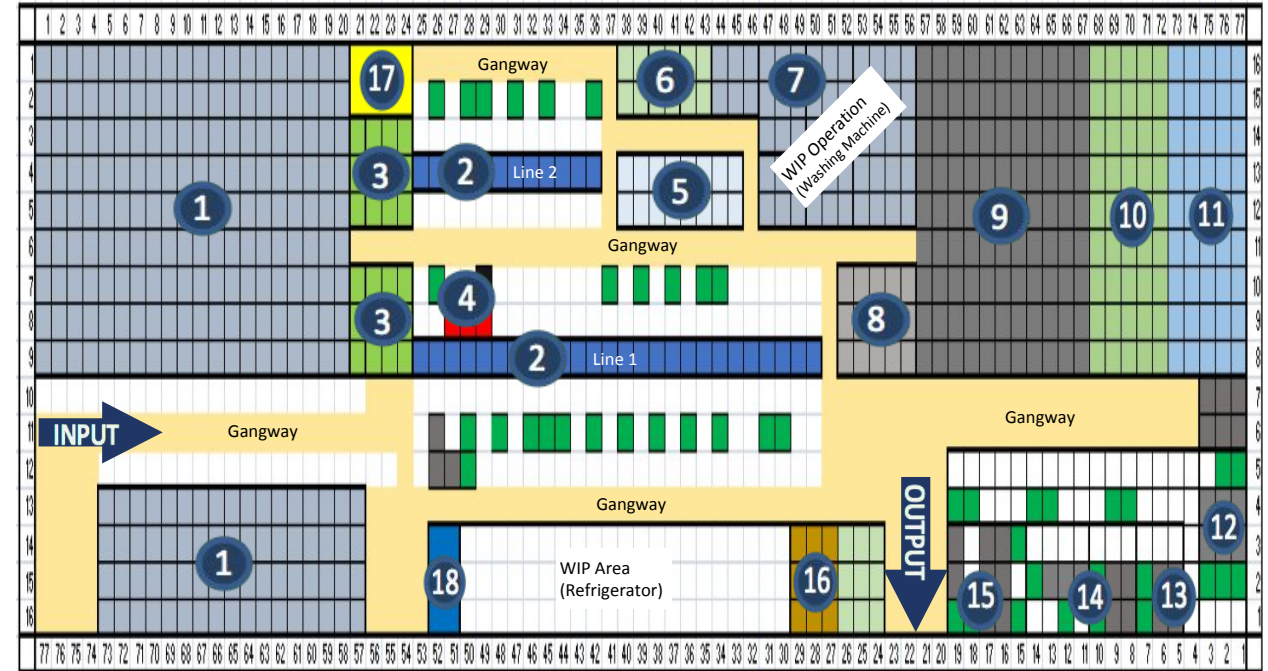
With a mission to leave the planet in a better state than what we got, Greenscape's focus is on extracting scarce valuable resources from E-waste



Equipped Facility for Advanced Recycling



100MT / Day
1,274 Sq Mts



MS (Ferrous) FG

Office Block - 1st Floor
Lab and Visitor meeting room - 2nd Floor

Plastic FG

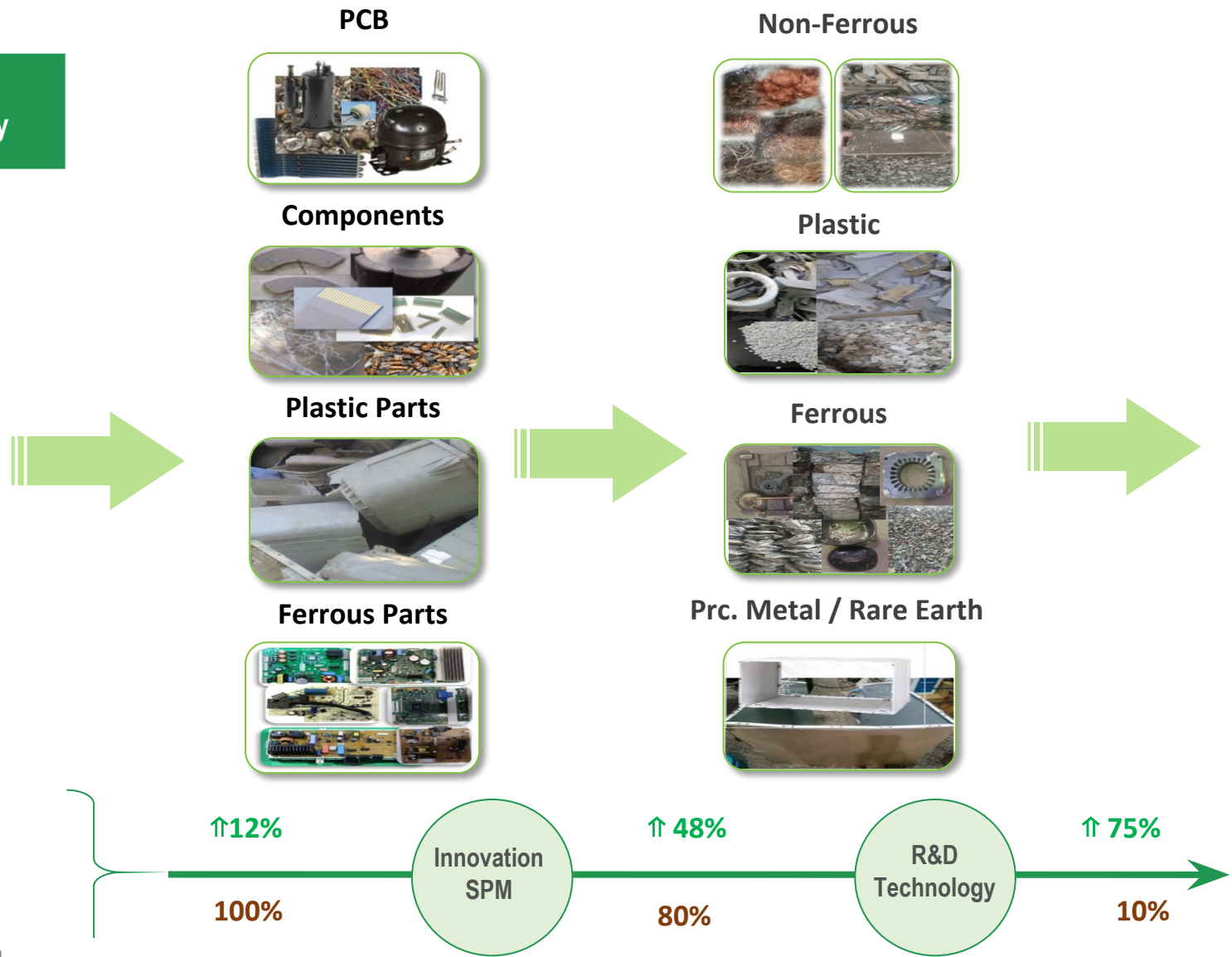
SN	Code	Allocated Area	Area (sqm)	SN	Code	Allocated Area	Area (sqm)	SN	Code	Allocated Area	Area (sqm)
1		Raw Material	248	7		WIP Operation	56	13		Cu Winding/Stator	18
2		Extraction Line	38	8		Plastic Cutting	15	14		Motor Cutting	12
3		RM Loading Area	24	9		Shredder Area	99	15		Heat Exchange	15
4		Refrigerant Recovery	-	10		Misc Equipment	45	16		Copper Al	18
5		Small Part Segreg.	16	11		Air Purification System	45	17		RM Inspection Area	6
6		PCB, Misc item storage	12	12		Comp Oil Rec/Cutting	21	18		Air Compressor	6

Material Efficiency Roadmap

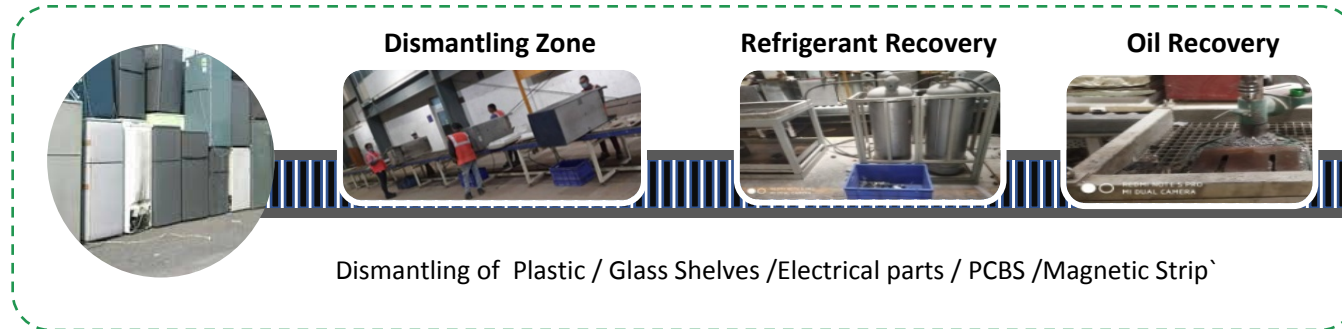
EPR >>> Material Efficiency



- Valued addition
- Milestone Achieved



Advanced Recycling Technology



Dismantling → Primary Crushing



Primary Crusher Feeding



Feeding of REF body
for Pre-crushing

Secondary Crushing



Pre- Crushed Ref body
feeding to Hammer Crusher

Secondary Crushing



Granulated mixed
output of plastic /
Ferrous / Non-ferrous
commodity

Eddy Current Separating



Removing Plastic from
Non Ferrous metals

Copper / Aluminum output



Segregating Copper
& I Aluminium

Plastic Output



Removing Plastic from
Non Ferrous metals

Magnetic Iron Separation



Removing Iron from
Plastics & Non ferrous
metal

Foam Output



Foam Compacting

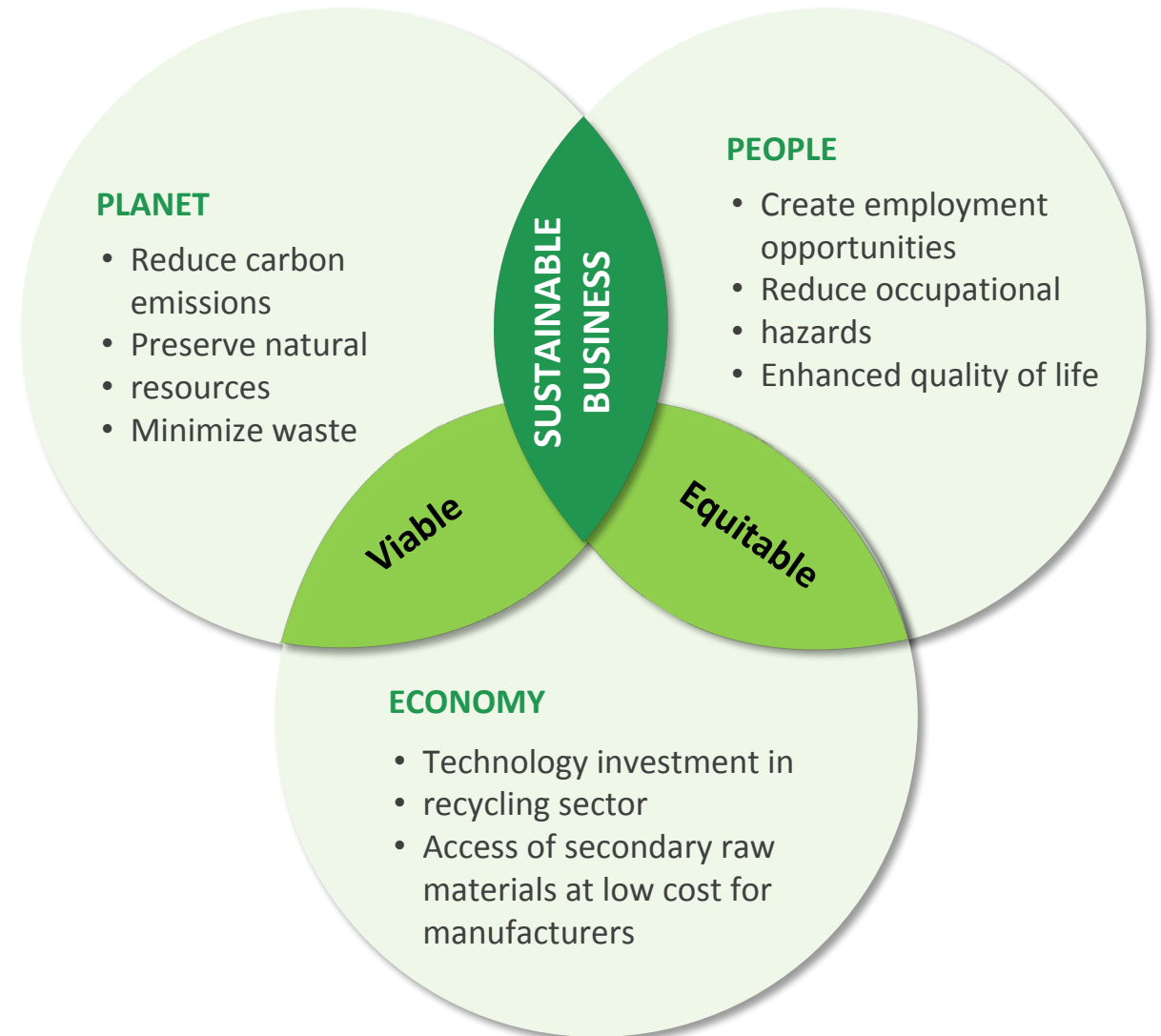
Recycling :

A Journey Beyond Net Zero



“Let us pledge to collectively work towards conserving precious environment resources. Let us live in harmony and keep our beloved earth clean and green”.

Shri Narendra Modi,
Hon Prime Minister of India





Thank you

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