



**Greenenergy**  
a green concern

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# E-WASTE -

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## FROM EDITOR'S DESK

Don't we all get excited when a new phone launches?..When a new television model launches?..When more stylish looking laptop is launched?...Well yeah... we are always eagerly looking forward to such developments and want to be one of the first ones to be benefitted by them...

No doubt there are so many pros of being updated with new technologies..new devices..new trends in electronics market...but as everything has both sides, even this development has got cons..and one of the major being issue of **E-Waste Management**. E-waste pollution is one of most concerning issue around the world and needs to be addressed as soon as possible for maintaining balance of generation and disposal of electronics.

This issue of Greenergy magazine addresses this problem and will inform you more about e-waste and its management.

- MS. ARATI PATIL

## GREEN UPDATES

### **IIT Madras developing platform to tackle e-waste by linking stakeholders in formal, informal sector**

Indian Institute of Technology (IIT), Madras is developing an innovative model to tackle electronic wastes (e-waste) by linking stakeholders in the formal and informal economy, according to officials. Called "e-Source", the exchange platform that will serve as an online marketplace for Waste Electrical and Electronic Equipment (WEEE) and facilitate a formal supply chain between various stakeholders (buyers and sellers). The initiative is being spearheaded by Indo-German Centre for Sustainability ..

source: <https://economictimes.indiatimes.com/>



## Covid Lockdown, Travel Restrictions Slightly Improved Air Quality: UN Agency

Pandemic lockdowns and travel restrictions caused dramatic but short-lived improvements in air quality and drops in pollution, the UN said on Friday, but warned the blip was no substitute for long-term action.

A new report from the UN's World Meteorological Organization (WMO) found that Covid-19 restrictions last year temporarily improved air quality in a number of places, especially in urban areas.

But they also spurred an increase in some pollutants that were both hazardous to health and had an unclear impact on climate change.

*source: <https://www.ndtv.com/>*

## Discarded face masks could be melted down and recycled to help tackle plastic pollution

Cardiff-based Thermal Compaction Group (TCG) is working to turn hospital waste into new masks with 65% recycled content.

The Welsh government has set targets to make Wales a "circular economy", producing [no waste by 2050](#).

Recycling expert Gary Walpole said public sector bodies such as the NHS could set an example by recycling PPE.

The firm heats single-use masks, gowns and curtains to 300C, sterilising all pathogens, and is recycling 300,000 defective masks each month, which would have otherwise been incinerated or sent to landfill.

*source: BBC news*

## Reuse and recycle: Google, Microsoft & Dell join forces to tackle e-waste crisis by 2030

PARIS: Major technology firms including Dell, Microsoft and Google have joined a new initiative aimed at creating a circular economy for electronics by 2030, amid mounting alarm over the world's ballooning e-waste problem.

The project comes as humanity's insatiable appetite for smartphones, household appliances and electronic car parts combined with the short lifespans of many tech products has made e-waste the planet's fastest growing refuse.

*source:* <https://economictimes.indiatimes.com/>



# GREEN COVER ARTICLES



1. **E-WASTE! WHAT'S THAT?**  
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## **E-WASTE! WHAT'S THAT?**

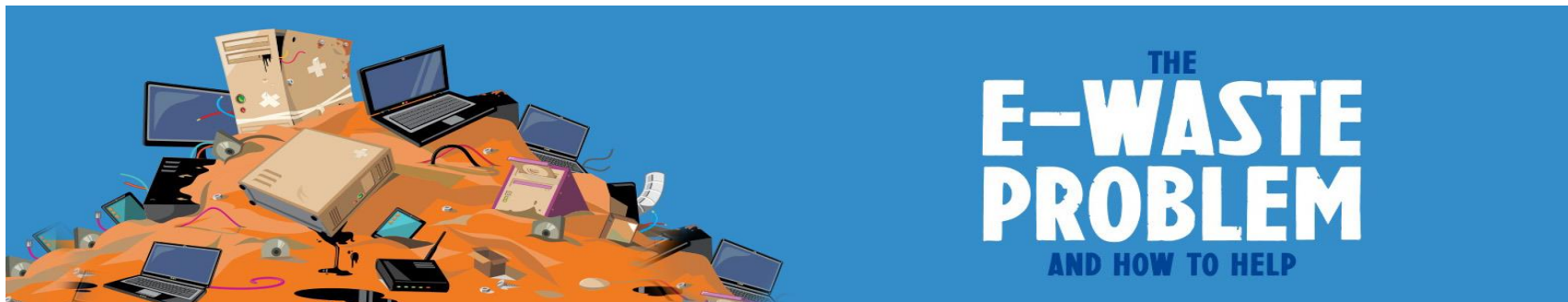
The 21st century is known as a digital era. As a part of it, we all are rapidly getting used to technology, whether home, work, transportation, travelling and many more activities! For the past thirty years, we have collected so many electronic solutions in our homes including a tape recorder, radio, FM, television, iron, DVD player, CD player, personal computer, laptop, hard disk, pen-drive, landline, mobile phone and the list is never-ending. We have just been collecting such electronic systems just for our luxury but never thought about their limited usage. The development of new systems has increased so rapidly that we are not even realising about throwing our old electronic systems in the corner while buying new systems.

A new critical concept is taking place that we need to deal with very carefully, electronic waste, also referred to as e-waste! In the beginning, we may think that it is not really a big concern, but yes, it is a rising concern worldwide.

## Why is e-waste a major concern for the 21st century?

- According to a United Nations report, global e-waste has increased by 21% from 2004 to 2019.
- In 2019, the world discarded 53.6 million e-waste.
- Only about 17.4% of the e-waste is recycled in 2019.
- We throw metals, rare elements, working systems in landfills that can be reused and billions of investments can be saved for other purposes.

Apart from that, let's see how e-waste affects our health, environment and overall ecosystem.





### Impact of e-waste on our health:

Electronic systems are made up of various metals, rare elements and plastic materials. Some of the elements include mercury, beryllium, cadmium, copper, iron, lead, chromium. If we keep these systems in our homes for a long time without properly destroying them, they start dismantling naturally. In this process, they emit toxic gases which are harmful to children, pregnant ladies and old people in our family. If we are exposed to such harmful gases for a long time, they start affecting on our different parts of our body, such as:

- **Mercury:** Affects kidneys, immune system and central nervous system, foetus and infant growth
- **Beryllium:** Causes lung diseases
- **Cadmium:** Joint and spine pain, neural damage
- **Lead:** Affects the reproductive system and kidneys, child's mental development
- **Plastics:** Burning produces dioxins harming the reproductive and immune system
- **Chromium:** DNA damage, asthmatic bronchitis

### **Impact of e-waste on our environment:**

We have already significantly polluted our environmental parameters such as air, soil, water with civilisation and industrialisation. Adding e-waste to landfills is degrading the environment dramatically. When we throw e-waste from our homes, offices, workplaces, and public places to the landfills, they start shredding naturally. Let's see how it affects our environment:

- **Air:** E-waste starts dismantling, shredding, or melting in landfills and releases dust and toxic gases. Moreover, burning e-waste also releases harmful burnt particles that promote air pollution.
- **Soil:** Microorganisms in the ground start breaking e-waste disposed of in landfills. It starts mixing in and contaminating the earth. Crops in the fields nearby may have residues of the toxic elements in the soil. Moreover, these harmful elements are combined into the underground water resources that we use, ultimately damaging our health.
- **Water:** Heavy metals in contaminated soil reach underground water resources and reach lakes, ponds, rivers and wells. When these particles react with water, acidification and toxification occur. We use these resources for drinking, cooking and other daily activities and directly consume the hazardous remnants. Moreover, it harms biodiversity and our ecosystem.

Author: Pranita Herwade-Kumbhojkar  
Science Communicator & a Freelance Content Writer

## **E-WASTE COLLECTION DRIVE,SANGLI..**

As a small step towards making Green Sangli, several environmental activists came together to spread awareness regarding e-waste. After several meetings, discussions and increasing volunteers, our independence day was finalised to make Sangli citizens free from e-waste from their surroundings. Even though Sangli was disrupted by a flood for a week, and people had to suffer from its consequences, they responded to the e-waste collection drive with enthusiasm.

The awareness was spread across the Sangli district, which inspired environmental activists from Islampur, Tasgaon and Palus. All drives were held on August 15, 2021, between 10:00am and 02:00pm. Though it was only 4 hours, about 7 tons of e-waste were collected from all four locations with more than 50 collection centres. Several institutes also took initiatives and continued the drive for a week. A small but hugely successful e-waste collection drive was witnessed by Sanglikars on independence day this year.

### **What will happen to the collected waste?**

1. It will be distributed to needy students.
2. If the waste material is repairable or reusable, this work will be given to handicapped or other social work organisations for their employment.
3. Completely destroyed or damaged e-waste will be destroyed as per the government guidelines and regulations.
4. All this work will be carried out by the Purnam Eco-vision organisation from Pune.
5. If any lead is available in Sangli, further movements will happen in Sangli under the guidance of Purnam Eco-vision.

**Let's use minimum electronic systems, reduce waste, reuse or repurpose and, if possible, donate rather than just throwing these systems into landfills.**

Author: Pranita Herwade-Kumbhojkar  
Science Communicator & a Freelance Content Writer

## E-WASTE: AN ENVIRONMENTAL DISASTER IN THE MAKING

- **E-waste**

**Electronic waste** (e-waste) is produced when expired or damaged electronic items are discarded. This includes mobile phones, televisions, computers, laptops, fax machines, VCRs, and many other electronic gadgets and types of equipments.

For every 1 million cell phones that are recycled, 35,274 lbs of copper, 772 lbs of silver, 75 lbs of gold, and 33 lbs of palladium can be recovered.

Only 12.5% of e-waste is currently recycled.



Usually, utilized electronics that can be easily reused, recycled, resold, disposed of without causing harm, and repairable re-usable items, are considered as e-waste. Several public policy experts apply “e-waste” to all surplus electronics

Cathode Ray Tubes (CRTs) is one of the hardest substances to recycle as these consists high concentration of lead and phosphorus and fits in the category of “hazardous household waste” stated by the *United States Environmental Protection Agency* (EPA). Despite this, EPA considers CRTs that have been set aside for testing to be commodities if they are not discarded, speculatively accumulated, or left unprotected from weather and other damage, The EU and its member states operate a system via the European Waste Catalogue (EWC) - a European Council Directive, which is interpreted into "member state law".

• **Types of e-waste**

1. Large household appliances (refrigerators/freezers, washing machines, dishwashers).
2. Small household appliances (toasters, coffee makers, irons, hairdryers).
3. Information technology (IT) and telecommunications equipment (personal computers, telephones, mobile phones, laptops, printers, scanners, photocopiers).
4. Consumer equipment (televisions, stereo equipment, electric toothbrushes).

**E-waste is locked up with toxic substances**

Electronics contain toxic substances such as beryllium, cadmium, mercury, and lead, which cause serious environmental issues.

When e-waste gets buried inside the land, microscopic traces gets mixed with the soil and groundwater and a pool of toxic materials is created inside. This is called leaching.

Leaching poisons groundwater and freshwater in the surrounding area.



- **Types of e-waste**

5. Lighting equipment (fluorescent lamps)
6. Electrical and electronic tools (handheld drills, saws, screwdrivers)
7. Toys, leisure, and sports equipment
8. Medical equipment systems (except all implanted and infected products).
9. Monitoring and control instruments
10. Automatic dispensers.

Health risk rises when we come in direct contact with toxic materials that leach from e-waste. Not only humans are at risk, but also terrestrial and aquatic animals. Dangerous substances can enter our body by inhalation of its fumes and indirectly through the soil, water, and food containing these substances



E-waste contributes more than 5% of all municipal solid waste globally and is increasing with the increase in demand for electronic products in developing products.

The maximum amount of e-waste is recycled in developing countries, where hazardous kinds of equipments are used in which metals are extracted and sold. Industries that recycle have to follow strict environmental regulatory regimes and high costs of waste disposal.



China is the largest producer of e-waste, generating more than 10 million metric tons in 2019. The United States ranked second with roughly producing 7 million metric tons of e-waste.

India is the third-largest e-waste generator in the world, capacity limited to treat only one-fourth of its waste. China, United States, and India together contributed 38% of the total 53.6 million tons (Mt) of e-waste, according to 2019 records

**It is very important to recycle e-waste properly before disposal.**



- MS. VEDANTHI JOSHI  
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## E-WASTE MANAGEMENT

Currently, the recycling sector of India is unorganized and only few organized e-waste facilities are available. More than 95% of recycling process is carried out in urban slums and this dangerous task is done by untrained workers without any protective equipment. This has harmful effect on their health as well as those around them.

E-waste recycling basically refers to reprocessing and re-use of electronic wastes. The process seeks to recover material from electronic wastes. As electronic devices are combination of various materials and components, many kinds of different components can be retrieved from these e-waste. Components which can be recycled from e-waste : Plastic, Metal, Glass, Mercury, Circuit boards, Hard Disks, Toners and Ink Cartridges, Batteries, etc.

The various steps of recycling e-waste are:

Step 1: Collecting and Transporting – The electronic waste should be collected and transported to the recycling plant regularly.

Step 2: Shredding and Sorting – The e-waste is shredded i.e. broken into smaller pieces to ease the process of sorting. The materials are categorized different categories accordingly.

Step 3: Dust Extraction – The tiny waste particles are smoothly spread to be broken down further. The dust is extracted and discarded in an environmentally compliant manner.

Step 4: Magnetic Separation – In this process, steel and iron gets separated from other wastes with the use of strong overhead magnet. Sometimes mechanical process too is needed to separate circuit boards, copper and aluminum from other waste particles.

Step 5: Water Separation – Glass is separated from plastic in this process.

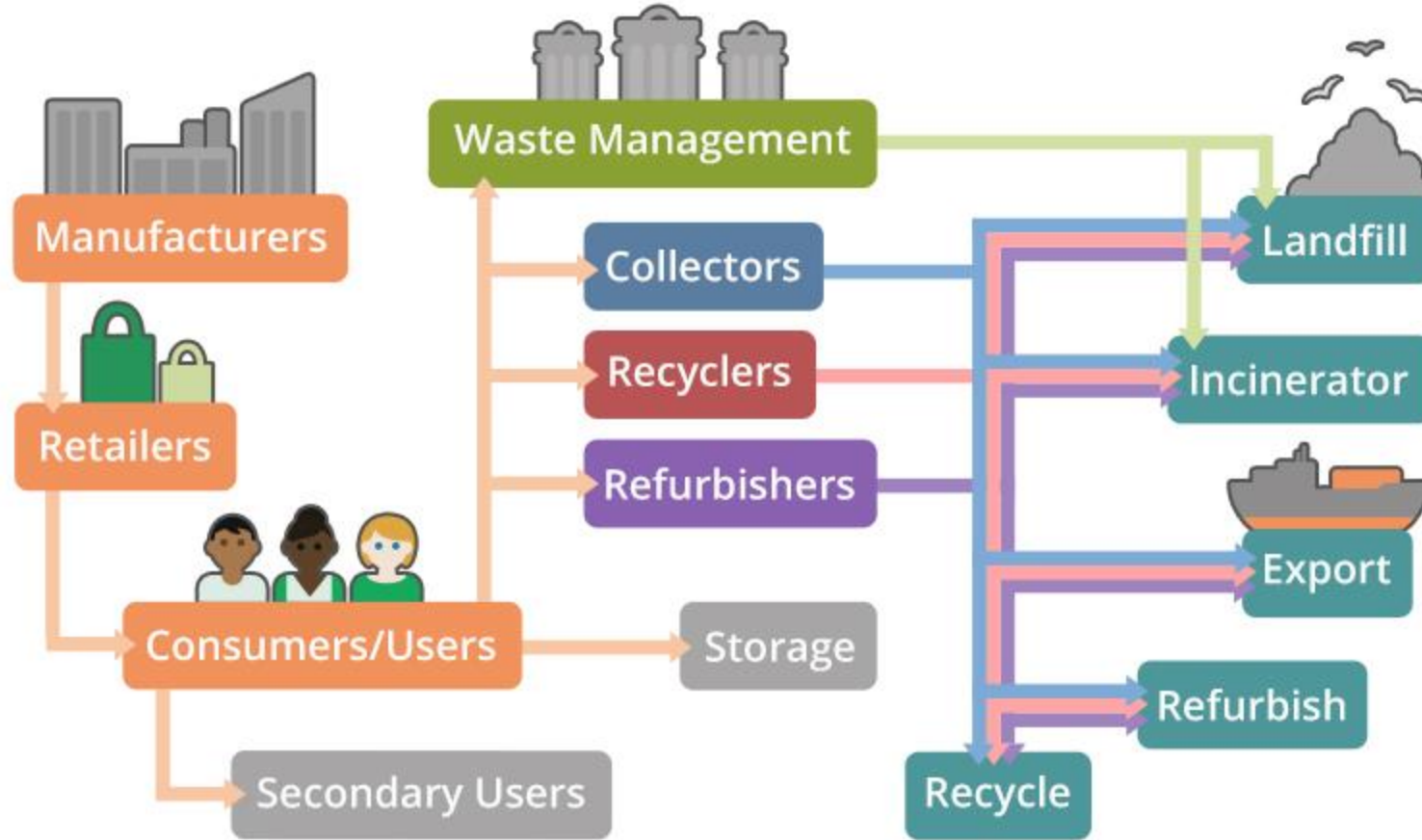
Step 6: Purification of Waste Stream – leftover metals from plastics are located and extracted to purify the waste stream further.

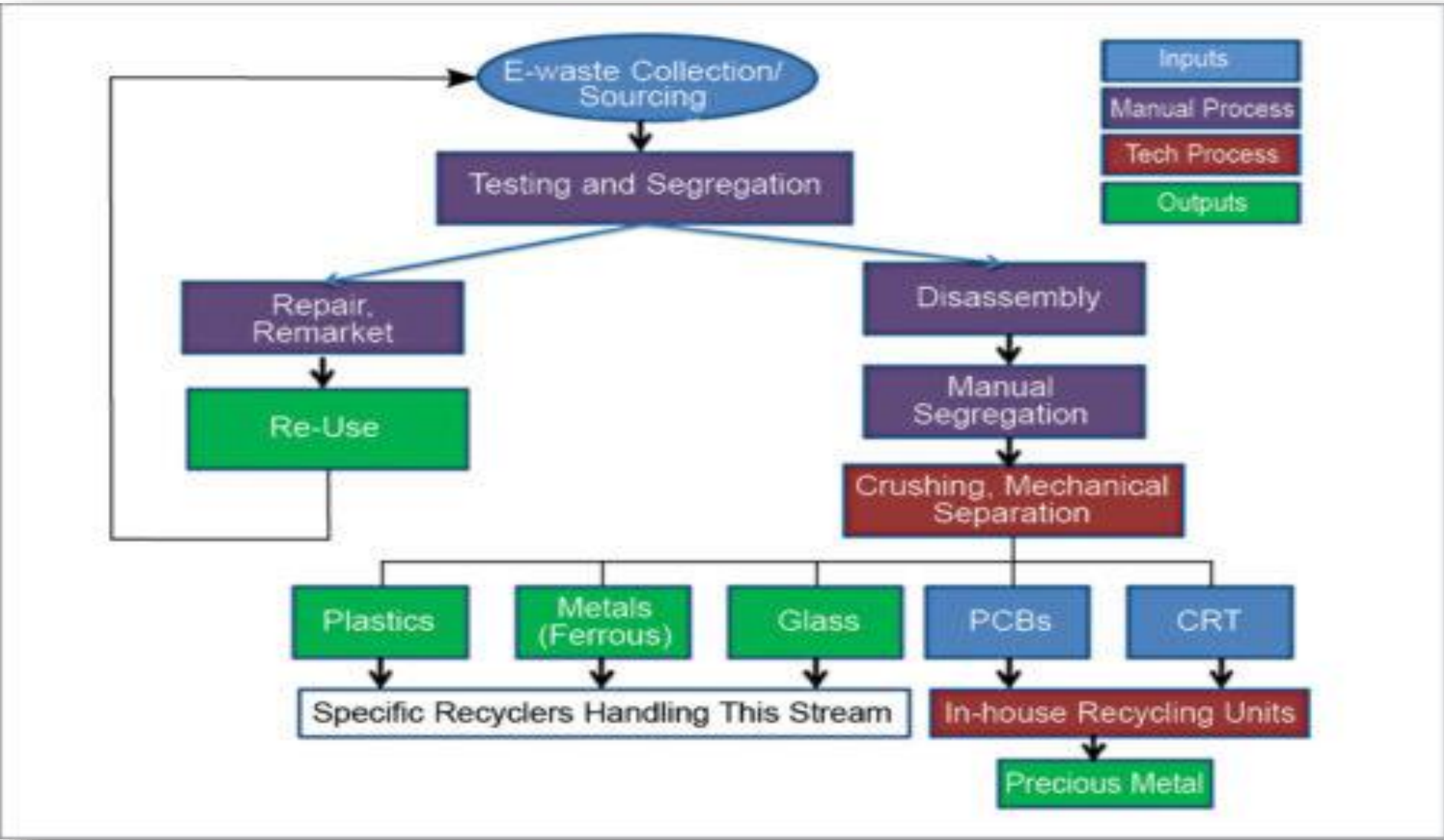
Step 7: Preparing Recycled Materials For Sale – The materials separated during the process get prepared for sale as raw materials to produce new electronics.

Although more and more research is being conducted for proper e-waste management techniques, yet there is need to generate awareness among people about the seriousness of this e-waste pollution. CPCB India is setting a certain set of guidelines for proper and eco-friendly handling and disposal of electronic waste. The Ministry of Electronics and Information Technology (MeitY) has initiated an e-waste awareness program under Digital India, along with industry associations from 205, to create awareness among public about the hazards of e-waste recycling by the unorganized sector, and to educate them about alternative methods of disposing their e-waste. As an effort to make the users aware of the recycling of e-waste, many companies such as Apple, Dell, and HP have started various recycling schemes.

# Lifecycle of Electronics

What happens during post productions





So called development, create toxic-mess,  
Machines gained value, but humans face-less  
To conquer the nature, technology is in haste,  
To safeguard our life, lets do away with E-waste...

# GREEN MOVIES

## WALL-E

WALL-E, a 2008 movie by Pixar Animation Studios and released by Walt Disney Pictures, conveys a strong message on the disastrous effects of consumerism, bad waste management and environmental degradation.

The movie is considered to take place in 29<sup>th</sup> century, when the Earth is no more habitable, and humans have moved to space. A robot '*Waste Allocation Load-Lifter (Earth Class)*' i.e. WALL-E is sent on Earth to clean it and the movie revolves around his story.

The message delivered by this movie is really something to be thought about in today's world..given the circumstances around us...its a glimpse of how our future will be like if proper measures are not taken..worth watching..

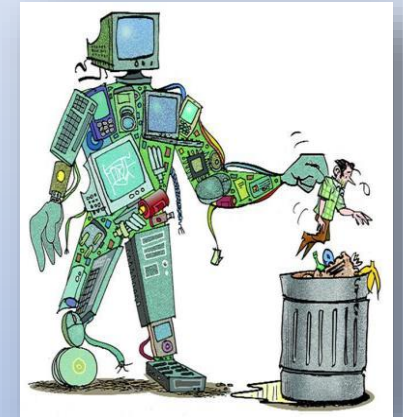


- MS. ARATI PATIL

# GREEN-O-PEDIA

## Did You Know That?

1. E-waste represents 2% of America's trash in landfills, but it equals 70% of overall toxic waste.
2. 20 to 50 million metric tons of e-waste are disposed of worldwide every year.
3. Cell phones and other electronic items contain high amounts of precious metals like gold or silver. Americans dump phones containing over \$60 million in gold/silver every year.



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