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E-WASTE

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INTRODUCTION

However, today, there is no greater amount of e-waste than products that are no longer functional or out of function. Technological advances come to us at an incredible speed, as many electronic devices that still function well are considered outdated. Consider the many VCR players that were swapped when DVD players came to the market. Currently, DVD players have been replaced by Blu-Ray players.

If the product is electronically driven and someone thinks they can make a better version, this contributes to e-waste. And we take care of it as unwanted electronics from around the world have been filling up landfills for years. In the US alone, the Environmental Protection Agency estimates up to 60 million tones of e-waste land each year.

DISCUSSION

E-waste Problems

It is anticipated that the definition of e-waste will continue to grow. An increasing number of highly advanced electronic products are being created and produced in this age of rapid technological improvement. Consider the idea of the "smart home." It is simple to see how many electronic gadgets can now accomplish a wide range of tasks, such as providing security, turning lights on and off, and brewing fresh coffee before we wake up.

Regretfully, owners are dismissing an increasing proportion of e-waste as rubbish. Computers, laptops, and cellphones are the most important examples of that.

Even when the existing model seems to be functioning perfectly, new ones keep coming out. In spite of this, the most recent edition consistently offers extra features that make it impossible to refuse.

Thus, in response to the query, "What is e-waste?" "It depends" would be a good response today.

Innovators in technology are still producing electric gadgets that are intended to simplify and improve our lives in every way possible. However, it appears that we are all too prone to throwing the equipment we now own too soon. How happy we have been with them thus far is irrelevant.

How is e waste recycled in India?

India produces over 2 million tones (MT) of e-waste a year, according to the Global E-waste Monitor 2017. After the US, China, Japan, and Germany, it comes in fifth place among nations that produce e-waste. Only 0.036 MT of India's e-waste were processed in 2016–17.

Just 20% of e-waste worldwide is recycled. According to a UN research, the overall recovery percentage of cobalt—a metal that is highly sought after for laptops,

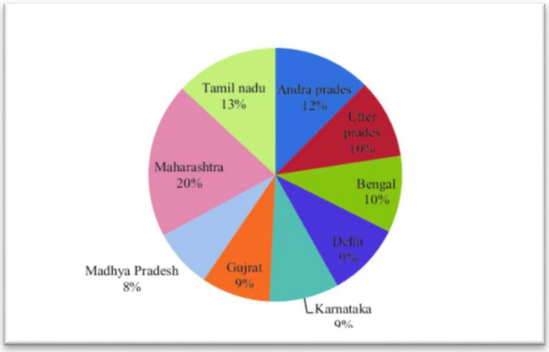
smartphones, and electric car batteries—from e-waste is only 30% because of subpar extraction methods.

Since 2011, India has had e-waste management laws requiring that only approved recyclers and dismantlers gather e-waste. On October 1, 2017, the E-waste (Management) Rules, 2016 came into effect. The rule's scope was expanded to include over 21 products (Schedule-I). Along with their products, the rule's scope was expanded to include parts, consumables, and spares of electrical and electronic equipment (EEE).

Extended Producer Responsibility (EPR), the industry standard for ensuring that end-of-life products are recalled, has been reinforced by the rule.

In the nation, e-waste is expanding at a compound annual growth rate (CAGR) of over 30%. According to estimates from ASSOCHAM, one of India's top trade associations, the amount of e-waste generated annually was 1.8 MT in 2016 and is expected to increase to 5.2 MT in 2022.

There are currently 178 registered e-waste recyclers in India that have been approved by the state governments to handle e-waste. However, a large number of e-waste recyclers in India do not recycle garbage at all.



Why is e waste recycling important?

When e-waste is not recycled or reused, new natural resources must be extracted from Mother Earth. Instead of recuperating from what is already in the environment, electronics are made using new resources. A vital part of the majority of printed circuit boards, or PCBs, are precious metals. Gold, silver, platinum, palladium, and so forth are among them. All of them are all around us, but they are hard to find since we are avoiding problems without realizing how serious they are. This has significant ecological implications. Hazardous emissions are a result of the production, transportation, and mining necessary to locate and extract valuable metals. Effective and prudent management of e-waste is crucial for lowering greenhouse gas emissions.

TYPES OF E-WASTE

1) **Home Appliances**
   - Microwaves
   - Home Entertainment Devices
   - Electric cookers
   - Heaters
   - Fans
2) **Communications and Information Technology Devices**
   - Cell phones
   - Smartphones
   - Desktop Computers
   - Computer Monitors
   - Laptops
   - Circuit boards
   - Hard Drives

3) Home Entertainment Devices

- DVDs
- Blue Ray Players
- Stereos

- Televisions
- Video Game Systems
- Fax machines
- Copiers
- Printers

4) Electronic Utilities

- Massage Chairs
- Heating Pads
- Remote Controls
- Television Remotes
- Electrical Cords
- Lamps
- Smart Lights
- Night Lights
- Treadmills
- FitBits
- Smart Watches
- Heart Monitors
- Diabetic Testing Equipment

5) Office and Medical Equipment

- Copiers/Printers
- IT Server Racks
- IT Servers
- Cords and Cables
- WiFi Dongles
- Dialysis Machines
- Imaging Equipment
- Phone & PBX systems
- Audio & Video Equipment
- Network Hardware (i.e. servers, switches, hubs, etc.)
- Uninterrupted Power Supplies (UPS Systems)
- Power Distribution Systems (PDU's)
- Autoclave
- Defibrillator

E-waste recycling process

Step 1: Collecting and Transporting

The initial step in recycling electronic waste is collection. In this case, recyclers are crucial in locating and gathering electronic garbage in designated locations' take-back booths or collection bins. The recyclers then take the rubbish to recycling plants and facilities after these containers are filled. Many collection sites will have multiple containers or boxes for different goods because it is best practice to divide e-waste by type at this point in the process. This is particularly crucial for electronic garbage that contains batteries, as they need to be treated carefully and can cause serious harm if combined with other rubbish.

Step 2: Storage

The method of safe storage is crucial. Despite its apparent simplicity, it can turn out to be a crucial component. Cathode Ray Tube (CRT) TVs and monitors, for instance, have glass displays that are heavily polluted with lead. They used to be recycled into brand-new computer monitors, but as technology advanced and the market for CRT products

shrank, a large portion of this glass is now just kept in storage indefinitely.

Step 3: Manual Sorting, Dismantling, Shredding

Shredded and sorted e-waste is the next step after collection, transportation, and storage. Shredding is essential to the separation of electronic trash. Efficiency is therefore crucial at this point. In order to properly separate waste, shredding entails disassembling and breaking it up into smaller pieces. These small costs are sorted by hand and then disassembled by hand. Since waste materials are now segregated to recover various portions, this is usually a labor-intensive process.

The materials are then divided into components and core materials. These tiny fragments are then divided into different groups. Items that can be reused in their current form and those that need further recycling procedures are usually included in these categories.

Step 4: Dust Extraction

The conveyor belt shakes to evenly distribute the little waste particles. The evenly distributed waste materials are subsequently further broken down. At this point, the dust is removed and disposed of safely to protect the environment. In this manner, environmental deterioration is prevented.

Step 5: Magnetic Separation

After that, you can separate iron and steel from other garbage with the use of a powerful overhead magnet. In this manner, the steel has been effectively recycled from the waste stream. However, in order to separate circuit boards, copper, and aluminum from other waste particles, mechanical operations might occasionally be necessary. The majority of polymers are used here in particular.

Step 6: Water Separation

Water separation technology thus becomes important for separating glass from plastic. Glass-containing leads can then be sent to smelters for use in the creation of new CRTs (Cathode Ray Tubes), batteries, and x-ray tubes.

Step 7: Purification of Waste Stream

The next step is locating and extracting leftover metals from plastics. To purify the waste stream further.

Step 8: Preparing Recycled Materials for Sale

The final stage is preparing recycled materials for sale. The materials, now separated, are prepared for sale and reuse. For some materials, such as plastic, steel, these all are allowed to join another recycling stream. Others may be processed onsite and sold directly alongside usable components separated in the early stages.

Business with e waste Recycling

E-waste is now one of the most prominent waste sources across the world. No doubt that e-waste poses major environmental consequences. However, it gives a wonderful opportunity to entrepreneurs. Who is willing to take the adventurous risk to have their own e-waste recycling business? India is one of the largest e-waste producers, which creates a major business opportunity for the e-waste management business.

All entrepreneurs should be thankful for increased purchasing power! Which has automatically increased disposable income; the sales of those electronic devices are increasing steadily. As a result of the new product launches, customers are now encouraged to replace their old electronic gadgets with new ones. This has shortened the life span of these old electronic devices. This results in a rapid increase in the amount of e-waste produced. The ongoing sale of electronic equipment in the coming years would generate a profitable economic environment for the e-waste recycling business model.

In the case of India, a diverse range of government permissions and licenses is needed to start an e-waste recycling business. The basic specifications, however, remain the same across states. The most common steps you need to follow for your e-waste recycling business are as follows:-

- Register at the Udhyog Aadhaar MSME status to begin your e-waste recycling business. You'll be able to do that online.
- Go to the State PCB (Pollution Control Board) and ask for permission to start an e-waste business. To apply for approval from the PCB, you need to submit several statutory documents.
- You will need the necessary approval from the Ministry of the Environment. If you wish to import e-scraps as part of your e-waste recycling business plan, you will also be given an extensive protocol by the Central Excise and Customs Board.

Conclusion

At the peak of climate change and temperature rise, it's become more important to save our environment. Utilization of available resources sustainably can minimize the consequences on the environment. e waste recycling is one of the tools that can make our environment safe. Recycling e-waste allows for the recovery of materials such as gold, copper, glass, aluminum, lithium, plastic, and more. According to one study, the value of the raw materials in e-waste was roughly 55 billion euros in 2016. What's more, these materials are returned to the supply chain for the production of new products, reducing the environmental impact and minimizing hazardous materials released into the environment. Generally increasing the sustainability in the production of new electronics. Thus, it contributes to a circular economy.

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