



Influence of Electronic Waste on Environment

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DESCRIPTION

Electronic garbage (e-waste), which consists of end-of-life electrical and electronic equipment, has become a serious environmental concern. E-waste recycling, which entails the systematic collecting of e-waste and its treatment for reuse of beneficial materials is a useful instrument for reducing the growing pile of e-waste, supplementing the scarcity of some primary resources, and bolstering the economy. E-waste, however, can contain toxic substances such as heavy metals and persistent organic pollutants such as Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), Brominated Flame Retardants (BFRs), Perfluoroalkyl and its substances (PFASs), polychlorinated dibenzo-p-dioxins (PCDDs), and Polychlorinated Dibenzofurans (PCDFs).

Cell phones, computers, video recorders, televisions, coffee machines, refrigerators, and medical devices are examples of electrical and electronic equipment (EEE) that make modern life easier, more comfortable, and luxurious. Short lifespans, limited repair choices, and rapidly evolving technology, on the other hands are causing a significant proportion of electronic devices to be discarded at the end of their useful lives due to damage, non-functioning, operational dangers, or the availability of better alternatives. Waste EEE (e-waste), which is mostly defined as "electrical or electronic equipment that is waste, including all components, sub-assemblies, and consumables that are part of the product at the time of discarding," has emerged as both global concern and opportunity, due to the massively high volume and health hazards associated with improper handling, disposal, or recycling, it is a major concern due to the high content of extractable valuable materials. According to recent data on global e-waste statistics, the global generation of 53.6 million tons of e-waste in 2019 increased from 41.8 million tons in 2014 and 44.7 million tons in 2016, with additional projections to expand to 74.7 million tons by 2030 at an annual growth rate of approximately 4%.

In most countries, e-waste created at the home level is managed in three ways: I by putting it into waste bins, (ii) by formal collection by government approved entities, and (iii) by informal

collection by individual waste dealers and companies. E-waste collected at authorized commercial and municipal collection points and pick-up services is often recycled at facilities with advanced technology, machinery, and infrastructure for the safe and effective removal of valuable materials.

Individual garbage firms or dealers, on the other hand, collect e-waste outside of the formal system, which is processed and recycled under sub-optimal conditions with rudimentary processes and sometimes without any precautions to limit hazardous chemical emissions into the environment. E-waste abandoned in landfills or sold to peddlers pollutes the environment *via* seeping into soil and groundwater, as well as by emission into the air, soil, and surface water.

In today's world of rapid technological advancements, a considerable amount of e-waste has gathered as a result of increased production of EEE that becomes e-waste when its useful life is through. For environmentally sound e-waste management, effective techniques are required at both the production and post-use stages.

Managing e-waste

E-waste contains rich secondary resources such as metals, polymers, glass, and rare earth elements. Estimates imply that a typical cathode-ray tube TV has around 450 g Cu, 227 g Al, and 5.6 g Au, demonstrating the richness of e-waste for precious elements. Similarly, a metric ton of discarded personal computers could yield more gold than 17 metric tons of gold ore.

E-waste management strategies

The amount of e-waste generated around the world is increasing at an alarming rate. On the one hand, inappropriate e-waste recycling without suitable safeguards might endanger human health; on the other hand, it provides jobs for innumerable underprivileged workers, especially in developing nations. As a result, attempting to manage the e-waste problem solely through the implementation of legislative laws and the establishment of

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channels for its organized recycling may not be sufficient. Electronic and electrical equipment have become nearly vital in this age of information and communication technology. Many of these devices become obsolete within few years of their

manufacturing due to the fast-changing nature of technology. These characteristics, combined with an increase in demand owing to people's increased spending power around the world, result in massive amounts of e-waste being generated.