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Group 5

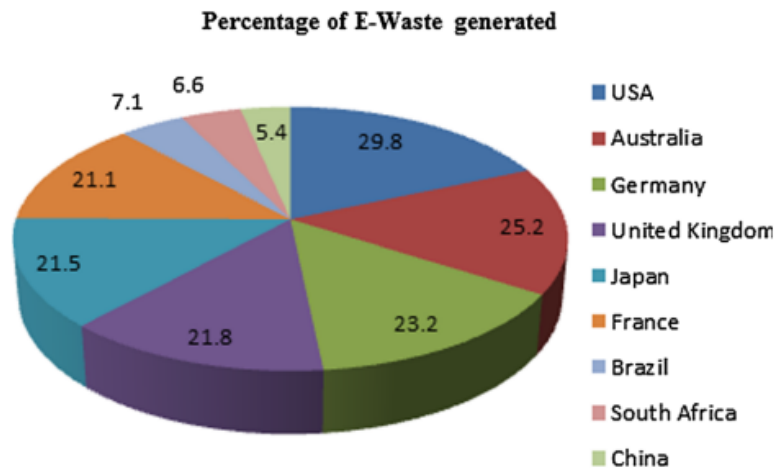
The Effects of Electronic Waste and Raising Awareness of its Negative Impacts around the  
World

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**Group Thesis Statement:** Raising awareness about proper recycling techniques for electronic waste is essential to minimize health risks for workers and environmental damage. With the constant advancement of technology, the promotion of practical and eco-friendly solutions is crucial in reducing environmental degradation and creating a sustainable future.

The rapid advancement of technology has led to a growing issue of electronic waste (e-waste) disposal and its adverse environmental and health impacts. E-waste, including discarded electronic devices, is often disposed of incorrectly, releasing toxic materials into the climate. This environmental pollution affects soil, water, and air quality, posing significant risks to human health and the ecosystem. Recycling e-waste safeguards the environment and supports global sustainability efforts. Furthermore, the inadequate recycling of e-waste contributes to environmental destruction, as valuable conductor metals are wasted, and non-recycled e-waste is incinerated in landfills and contributes to global warming issues. E-waste is now recognized as a serious global issue that requires attention and action from various organizations and accountability from governments worldwide.

Currently, almost everyone has some form of electronic device and almost every day there is a better, and improved version that is demanded by the consumer. This entices companies to rapidly expand and improve their electronics to keep up. This creates a problem when it comes to recycling and disposal. It is not just one country's problem but is a global issue as seen in a study done in 2014 from *Figure 1*.



*Figure 1. The generation of electronic waste in kg/capita globally*

No matter the size it could potentially contain hazardous materials which if not disposed of correctly could produce negative side effects for people and the environment. Holding accountability and creating laws to restrict this disposal will help reduce the impact of these hazardous materials. Even with these laws, informal and illegal methods are used, creating an issue globally. E-waste is a rising problem around the world, so it is important to take it seriously to ensure a safe and sustainable future.

When it comes to the global impact of electronic waste, many governments are forming an alliance that helps reduce the negative impacts of the hazardous materials released from

disposal or recycling. Many countries use different policies from concepts like WEEE<sup>1</sup>, EPR<sup>2</sup>, and RoHS<sup>3</sup>. Each of these concepts has policies that are designed to improve the environmental performance of electronics. It is said that “The EPR policy is considered by OECD as well as the EU as one of the most promising means to combat the increasing generation of waste and pollution” (Nnorom 2008). The EPR is a policy that is instructed through administrative, economic, and informative instruments as shown in *Figure 2*.

Administrative instruments	Collection and/or take-back of discarded products, reuse and recycling targets, setting emission limits, recovery obligation, product standards technical standards
Economic instruments	Material/product taxes, subsidies, advance disposal fee systems, deposit-refund systems, upstream combined tax/subsidies
Informative instruments	Environmental reports, environmental labeling, information provision to recyclers about the structure and substances used in products, consultation with authorities about collection network

Figure 1. Policy instruments used in the implementation of EPR

These policies are in place to help combat pollution which will help prevent environmental degradation. On top of these methods, there are also different approaches<sup>4</sup> used in EPR that each government decides to implement (Figure 3). For example, in the mandated product take-back, “this policy approach, the government mandates that manufacturers, importers and/or retailer take-back products at the end of the products useful life” (Nnorom 2008).

Type of EPR approach	Example
Product take-back programs	*Mandatory take-back *Voluntary or negotiated take-back programs
Regulatory approaches	*Minimum product standards *Prohibition of certain hazardous materials or products *Disposal bans, *mandated recycling
Voluntary industry practices	*Voluntary codes of products *Public/private partnership *Leasing and “servicing”, *labeling
Economic instrument	*Deposit-refund schemes *Advance recycling fees, *Fees on disposal *Material taxes/subsidies

Figure 2. The possible approaches to EPR with examples

<sup>1</sup> WEEE stands for Waste Electrical Electronic Equipment

<sup>2</sup> EPR stands for extended producer responsibility

<sup>3</sup> RoHS stands for Restriction of Hazardous Substances

<sup>4</sup> Look at Figure 3 to see the different examples of approaches used by the EPR Policies

Utilizing different policies and techniques is the foundation for creating a safe and sustainable future. It is shown that “recycling and recovering metals from e-wastes are laborious and undesirable in recent days. However, new techniques are introduced which are efficient as well as cost-effective” (Chatterjee 2017). The more effort put into finding solutions to this global issue the better the process gets over time. Raising proper awareness will not only help efforts to keep the environment safe but will create cost-effective methods that help sustain the industry for the future.

Even with the attempts of proper techniques, there are still many issues when it comes to the disposal and recycling of electronic waste. There are many places throughout the world that still use illegal and unsafe practices which have numerous negative consequences. It’s said that “According to the United Nations, illegal e-wastes hubs covers almost 90 % of the e-wastes dumped per year. Countries in Asia and Africa are leading in illegally dumping e-wastes in vacant lands” (Chatterjee 2017). Due to no oversight certain parts of these countries follow no such policies which creates a hazard for everyone. Without laws or regulations to help provide safe disposal practices it puts people's health and the environment at risk. In a research study<sup>5</sup>, “Samples were collected from open burning sites, disposal areas of e-wastes and lagoons nearby open burning areas. High concentration of copper and lead in the samples of open burning sites were found followed by zinc, manganese, and antimony” (Chatterjee 2017). These are toxic materials that are being released and “The unbridled deposition and processing of electronics waste leads to heavy metals and toxic chemicals being released in the environment. This affects not only soil and water but also the plants and animals to a large extent” (Chatterjee 2017). Understanding that electronic waste is a major issue is the first step to combating and finding solutions for countries all over. It is not good enough just to worry about one own country when in other parts of the world there are no regulations to help keep track of proper disposal and recycling methods. In some places where governments do not have any regulations, they rely on self-employed individuals who go door to door collecting e-waste. Even though “this option is the worst choice due to its inherent risks to human health and low collection and management, still these types of informal collection activities are being used by many unskilled individuals to earn and lead a basic life” (Shahabuddin 2022). Today there are still illegal practices being used to help provide an income for people in less developed countries and it is important to help find other methods to provide a solution to this global issue.

On the contrary, although e-waste recycling and disposal help minimize the negative toxic impacts, the monetary costs and efficiency of disposal methods still bring up continuous issues. Some would say that even with all the hard work being put into finding better practices, this solution only costs more money and does not provide enough beneficial results. The monetary worth of e-waste raw materials is estimated to be \$57.0 billion. However, only \$10.0 billion worth of e-waste is recycled and recovered sustainably, offsetting 15.0 million tones (Mt) of CO<sub>2</sub>” (Shahabuddin 2022). Utilizing safe practices of recovery still doesn’t provide the total potential available for recycling and in doing so still adds to negative effects on people's health or the environment. Not only that but even with the correct regulations it is still a laborious task that involves toxic materials. “Even though all necessary legislation is in place for e-waste collection and recycling, it is still challenging to handle and process e-waste due to its complex mix of hazardous, precious, base, and other materials” (Shahabuddin 2022). Overall, even if

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<sup>5</sup> This study was conducted in 2008 in Ghana

placing regulations for proper methods is not the right way to find a solution, electronic waste is a rapidly growing issue that needs to be brought to people's attention to raise awareness and find better solutions for a sustainable future.

In conclusion, electronic waste is a growing epidemic worldwide that is affecting not only the environment itself but also the life in the environment. Due to the many different legal and illegal methods of dealing with e-waste, it is important to understand the negative effects when looking at this issue. Electronic waste is a hazardous material that can release toxic chemicals which cause many negative effects, like health problems, and even environmental pollution. Some of these effects are irreversible so it is important to find safer means of practice before it is too late. So, it is essential to raise awareness and find better methods of disposal to keep a clean and sustainable future.

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## Student Biography



Preston Hudlow is a transfer student in his third semester at Old Dominion University. He is finishing his junior year this semester. He recently finished his associate degree in biology from Blue Ridge Community College. He is majoring in Marine Biology with a minor in GIS. Recently he has applied for an RA position with the school as well as an officer position with the Marine Biology club. He is interested in this topic because it is important to be aware of harmful pollutants that not

only affect human health but also the environment. He wants to understand more about this subject and see how it could affect water quality since his major is in Marine Biology. He is responsible for researching the different policies/regulations in place and the rebuttal that counters the argument.