



# Government Efforts To Reduce Electronic Waste In Msmes Based On Existing Regulations Micro, Small and Medium Enterprises

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**Abstract.** Rapid technological developments have led to a significant increase in electronic waste (e-waste). The daily activities of MSMEs and society cannot be separated from electronic devices. Electronic products have reached the end of their useful life, they will end up as waste. Electronic waste is included in the B3 category because it contains dangerous contents in electronic device components. For this reason, special management is needed so that it does not pollute the environment and public health. High levels of electronic waste accumulation actually do not only occur in developed countries, but also occur in developing countries. The technological innovations currently being developed are apparently not long-lasting technologies, thus encouraging consumers to replace their electronic goods with new ones in a shorter period of time. The performance of this industry raises concerns about electronic waste. The aim of this research is to find out and understand the government's efforts to reduce electronic waste in MSMEs based on existing regulations. The approach method used is a normative-empirical juridical approach, implementing normative legal provisions (laws) in action on every particular event or legal fact that occurs in the field in a society and then used as a solution or resolution to a problem. The research writer used a prescriptive analytical method so that he could write down the conformity of laws and regulations with facts and obtain a comprehensive picture of legal issues, facts and the impact of policies on MSMEs in realizing a good and decent living environment in electronic waste management. This research tries to look at existing data using qualitative research methods with a prescriptive analysis approach. The statement has a critical dimension towards MSME policy, but can describe a comprehensive sustainable development dialogue.

Keywords: MSMEs, Waste, Electronics.

## 1. Introduction

As we know, technological developments in the digital era have a huge impact on people's lives, both as consumers and as business actors. Technological advances help advance

economic development in the world. If we look, many people use technology to market their products to the public because it is very easy to use [1]

Currently, the world has entered the era of Industrial Revolution 4.0, which is marked by the "Internet of Things" (IoT) phenomenon. IoT is a concept where objects have the ability to transfer data over a network without requiring two-way interaction, either human to human or human to computer devices. The Industrial Revolution 4.0 is accelerating due to the Covid-19 pandemic, people are encouraged to practice physical distancing as an effort to stop the spread of the virus. Physical distancing encourages various activities to be carried out online, so various technological innovations are born to support online-based activities [2]

Not yet finished with developments in the Industrial Revolution 4.0 era, Japan initiated a new concept, namely Society 5.0, which describes a concept of human relations. According to Yuko Harayama, Society 5.0 is an information society built on the Industrial Revolution 4.0 with the aim of creating a prosperous society. The difference is, Industrial Revolution 4.0 utilizes artificial intelligence, while Society 5.0 focuses on the human component. This idea is influenced by dramatic changes that fundamentally change society and innovation, so the quality of human resources needs to be improved to support the success of the transformation of Society 5.0.

Indonesia cannot avoid the vortex of change triggered by the Society 5.0 era. Indonesian people are required to have HOTS (High Order Thinking Skills) abilities, namely having critical thinking and being faster in producing solutions to meet their needs. As a result, humans will continue to dig up information and create new information to support their survival. Apart from improving the quality of human resources, adequate digital infrastructure is also needed so that Indonesia is able to enable its society to continue to follow developments.

Rapid technological developments have led to a significant increase in electronic waste (e-waste). In Indonesia, the method of processing electronic waste by burning is considered inappropriate when applied, because electronic waste definitely contains metals and will cause dangerous air pollution [3].

The types of electronic waste that come from households and MSMEs are cables, lights, batteries, rice cookers, televisions and other household electronic devices. The use of electronic devices has a usage period, so that at some point the electronic devices cannot be reused and will even end up as electronic waste.

Given these conditions, the accumulation of electronic equipment will continue. Electronic devices are a type of waste that is difficult to decompose. If electronic waste is thrown into environmental media directly, it can cause irreversible environmental damage, has toxic properties and threatens natural ecosystems [4].

Electronic waste contains dangerous and toxic materials such as cadmium (Cd), chromium (Cr), mercury (Hg) and other chemicals which are carcinogens for the human body which can be linked to cancer and have an impact on reproduction which is very dangerous for humans [5].

Considering materials that are dangerous for the environment and human health in the future, electronic waste is included in the type of waste that contains B3. If electronic waste is thrown into environmental media, especially soil and water, it will cause pollution and threaten human health. Meanwhile, everyone has the right to a good and healthy living environment, including as part of human rights. A healthy environment is an environment that provides support for the creation of healthy individuals and communities. So that this can mechanically avoid health problems caused by liquid, solid and gas waste and also avoid dangerous chemicals, pollution, disease-carrying animals and other negative things.

The amount of electronic waste is increasing every year, which will always result in a buildup. Based on the latest data report released by The Global E-Waste Statistics Partnership in 2020, the current amount of electronic waste in the world is 53.6 million tons. This number broke the highest record in 2019 [6].

The increase in electronic waste in several countries is caused by trade and imports of waste. Since 2014, the issue of electronic waste has become a global concern. The Asian continent is the largest producer of electronic waste with a total of 16 million tons. If calculated per head, each person disposed of 3.7 kg of electronic waste in 2017. Indonesia itself disposes of around 3.0 kg of electronic waste per head. According to KLHK records, in 2021 Indonesia will produce 2 million tons of electronic waste originating from households and the island of Java contributed up to 56%. Electronic waste should be managed specifically and not mixed with other types of waste. Managing specific waste from electronic goods is the responsibility of each region. If you look at the problem that occurs in Karawang Regency, there is still very little knowledge about how to manage electronic waste.

Article 59 of Law Number 32 of 2009 concerning Environmental Protection and Management only explains the management of hazardous and toxic waste (B3) in general. Management of B3 waste, especially electronic waste from households, must be carried out carefully, considering the potential dangers that arise if there are errors in its management. So special policies are needed that must be issued by the government in managing electronic waste. This management must be carried out as effectively as possible to avoid the risk and accumulation of electronic waste which is increasing along with the growth and desire of society for technology in Indonesia which is increasingly rapid every year. Overall, the electronic waste management policy requires a strong commitment, because there are still many deviations. The power of the Basel Convention is only to provide policy awareness to member countries adhering to this convention. Apart from that, high awareness is needed

from the public and official electronic waste managers regarding procedures for managing electronic waste.

Indonesia, as the largest archipelagic country in the world, has 17,508 islands with a coastline of 81,000 km, and has enormous coastal and marine resource potential. The area of Indonesia's territorial waters is 5.8 million km<sup>2</sup>, consisting of 3.1 million km<sup>2</sup> of Indonesian waters and 2.7 km<sup>2</sup> of Indonesian Exclusive Economic Zone (ZEEI) waters or 70 percent of Indonesia's total area. The large potential of Indonesia's marine resources, the potential of marine fish resources in all Indonesian waters (excluding ornamental fish) is estimated at 6.26 million tons per year, reflected in the large biodiversity, in addition to the potential for coastal fisheries cultivation in the sea and marine tourism [7] .

As we know, existing waste management, whether electronic or not, is still inadequate. There are several obstacles in reducing electronic waste in Indonesia. However, the government is trying to reduce electronic waste in MSMEs based on existing regulations.

Based on the description above, the following problem formulation is what are the government's efforts to reduce electronic waste in MSMEs based on existing regulations?

## **2. Methods**

**Approaches and Types of Research.** The method used in this research is a sociological legal approach because the problem studied is approached from society, namely reducing electronic waste in MSMEs based on existing regulations. Meanwhile, the research specifications used are in the form of descriptive research, meaning that the procedure for solving the problem studied is to describe the current object and subject based on existing facts.

To obtain information or data that is accurate, related and relevant to the problems and resolution of this research, the research location was chosen, namely Karawang. By conducting research in these locations, it will be very easy to access data for the accuracy of preparing this research.

The data that will be collected are: Primary data, obtained directly from the field by conducting interviews with MSME actors in Karawang, especially coastal areas, village governments and also the community. Secondary Data, 1945 Constitution, Civil Code, Law No. 20 of 2008 concerning Micro, Small and Medium Enterprises; Law No. 18 of 2008 concerning Waste Management; Law No. 32 of 2009 concerning Environmental Protection and Management; Government Regulation No. 27 of 2020 concerning Specific Waste Management; Government Regulation No. 22 of 2021 concerning Implementation of Environmental Protection and Management; as well as implementing other regulations. Tertiary data is literature, statutory regulations.

**Data Collection Techniques** To obtain the data needed to complete the research carried out, the author uses data collection techniques which are divided into: interviews, namely data collection techniques by asking questions directly to respondents, Literature Study Literature study in this data collection technique is a type of secondary data which is used to assist the research process, namely by reviewing and analyzing legal and regulatory literature, as well as other data related to the problems discussed in this research.

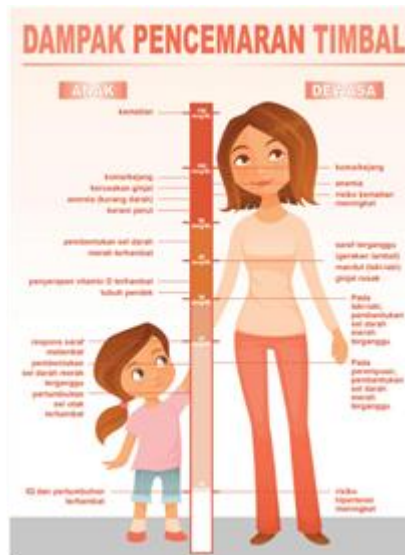
**Population and Sample** The population in this research includes MSME business actors, village governments and also the community. The data analysis method used is a qualitative method, namely analysis that combines data in the form of observations, interviews, written materials in the form of books related to this research.

### **Literature Review**

The level of consumption of electronic goods in Indonesia is increasing. A person's desire for electronic goods has become a primary need to help them with their work. Of all the types of electronic items used, each has a certain lifespan so there will come a time when the item needs to be replaced or thrown away. Thus the item will become waste. Electronic waste contains components or is made from hazardous and toxic materials (B3), such as lead, mercury, cadmium, etc. In 2030 it will increase by 4.7 Mt if handled in a business as usual manner. Electronic waste contains valuable materials such as precious metals and rare earth elements which have high economic value. The LHK Instrument Standardization Agency is currently pioneering its efforts in Governing State Property [8].

Government Regulation Number 27 of 2020 concerning Specific Waste Management mandates that E-waste be included in the category of specific waste that requires special management due to its nature, concentration and/or volume. Specific waste management must be carried out systematically, comprehensively and continuously, including reduction and handling activities.

Becomes specific waste, because E-waste contains components or is made from dangerous and toxic materials (B3), such as lead, mercury, cadmium, etc. which, if not managed properly, will be at risk of polluting and endangering the environment and the survival of humans and living creatures. other. There is a lot of information and educational material circulating regarding the impact of hazardous and toxic materials from e-waste components.



**Fig 1.** Impact of Lead Pollution

According to the Global E-Waste Monitor [the International Telecommunication Union (ITU) and the Sustainable Cycles (SCYCLE) Program by the United Nations University (UNU) and the United Nations Institute for Training and Research (UNITAR), and the International Solid Waste Association ( ISWA)] explains that e-waste is one of the fastest growing waste streams in the world. Globally, e-waste is generated on average 7.3 kg per capita. In 2019, it was 53.6 Mt (metric tons) and in 2030 it will increase by 4.7 Mt if handled in a business as usual manner.

Nationally, according to Bappenas - our recycling rate is 17.4% of the total 2 million tons of e-waste in 2021. Why is this figure still low even though e-waste contains valuable materials such as precious metals and rare earth elements? which has high economic value. This is a challenge for the government, especially since the government received a mandate from Government Regulation Number 27 of 2020 concerning Specific Waste Management, namely the obligation of every person who produces waste containing B3 to reduce waste. Waste reduction is carried out through 1) limiting waste generation; 2) waste recycling; and/or 3) reuse of waste. If the government as the producer of specific waste is unable to recycle it, it must be handed over to a specific waste management facility. Currently, specific waste management facilities follow the provisions for B3 waste management while the government provides specific waste management facilities.

The environment is basically the most important part for the survival of living things. Human awareness of the environment is the main factor in preserving the environment so that it remains sustainable. The realization of a clean and healthy living environment is one of the ideals of the Indonesian nation which has been confirmed in Article 28 H paragraph (1) of the 1945 Constitution, that: "Everyone has the right to live in physical and spiritual prosperity, to have a place to live, and to have a comfortable living environment. good and healthy and has the right to receive health services." Based on the provisions of this article, society has the right to have a clean and healthy environment. With these regulations, humans are made into one element of all environmental elements. In this perspective, environmental objects and humans have equality with everything that exists in nature. [9].

The economic growth of a country is defined as an increase in the long-term capacity of the country concerned to provide various economic goods and services to its population. This increase in capacity is determined by technological, institutional and ideological progress in various existing conditions [10]. According to the views of economists, there are four factors that influence economic growth, namely: population, stock of capital goods, land area and natural resources and the level of technology used. Even though it realizes that economic growth depends on many factors, classical economics mainly pays attention to the influence of population growth on economic growth. In growth theory, it is assumed that land area and natural wealth are fixed in quantity and the level of technology does not change. Based on classical growth theory, put forward a theory that explains the relationship between per capita income and population.



Fig 2. Indonesian Economic Growth

Micro, Small and Medium Enterprises MSMEs are independent productive business units, which are carried out by individuals or business entities in all economic sectors [8]. In principle, the distinction between Micro Enterprises (UMi), Small Enterprises (UK) and Medium Enterprises (UM) is generally based on the initial asset value (excluding land and buildings), average annual turnover or number of permanent workers. In Indonesia, the definition of MSMEs is regulated based on Law of the Republic of Indonesia Number 20 of 2008 concerning Micro, Small and Medium Enterprises. Definition according to Law no. 20 of 2008 are as follows:

### 1. Micro Business

Productive businesses owned by individuals and/or individual business entities that meet the Micro Business criteria as regulated in this Law. Small businesses are productive economic businesses that stand alone, which are carried out by individuals or business entities that are not subsidiaries or branches of companies that are owned, controlled, or are part, either directly or indirectly, of medium or large businesses that meet the business criteria. Small as intended in the Law. Micro businesses are business units that have assets of a maximum of IDR 50,000,000 excluding land and buildings where the business is located with annual sales proceeds of a maximum of IDR 300,000,000.

### 2. Small Business

Small businesses are expected to be able to provide new jobs. If the growth in employment by the large and medium business sectors is consistent, unemployment will be targeted, even if entrepreneurship development and the growth of new business units are carried out optimally, open unemployment will be suppressed. Job opportunities and increased income are expected to help create a prosperous Indonesian society. It is difficult to make this happen if people live in poverty and have high levels of unemployment, as a result of the inequality in control of productive resources that is still very real. Small businesses with an asset value of more than Rp. 50,000,000 up to a maximum of assets of IDR 500,000,000 excluding land and buildings where the business has annual sales proceeds from IDR 300,000,000 to a maximum of IDR 2,500,000,000.

### 3. Medium Business

Medium Business is a productive economic business that stands alone, which is carried out by an individual or business entity that is not a subsidiary or branch of a company that is owned, controlled, or is part either directly or indirectly with a Small Business or large business with a net worth of or annual sales proceeds as regulated in the Law. Medium businesses are companies with a net worth of more than IDR 500,000,000 to a maximum of IDR 100,000,000,000 with annual sales of more than IDR 2,500,000,000,000 billion to a maximum of IDR 50,000,000,000



#### 4. Micro, Small and Medium Enterprises (MSMEs)

The definition of small business in Indonesia is still very diverse. According to the Ministry of Industry and Bank Indonesia (1990), a small business is defined based on the value of its assets, namely a business whose assets (excluding land and buildings) are worth less than IDR 600,000,000. Meanwhile, the Ministry of Trade defines small businesses as businesses whose working capital is less than IDR 25,000,000. According to the Central Statistics Agency (BPS), small industries are industrial businesses that involve a workforce of between 5 and 19 people. Meanwhile, home industries are industrial businesses that employ less than 5 people.

In general, the definition of micro, small and medium enterprises (MSMEs) is a business that produces goods and services using primary raw materials based on the utilization of natural resources, talents and traditional works of art from the local area. The characteristics of MSMEs are that raw materials are easy to obtain, use simple technology so that it is easy to transfer technology, basic skills have generally been passed down from generation to generation, are labor intensive or absorb quite a lot of labor, market opportunities are quite broad, most of the products are absorbed locally. the local or domestic market and others have the potential to be exported, certain commodities have unique characteristics related to local regional cultural arts works and involve local economically weak communities in an economical and profitable manner.

### 3. Results and Discussions

The increasing use of electronics, especially in MSMEs, can result in an increase in electronic waste. The existence of MSMEs cannot be eliminated or avoided from today's national society. Because its existence is very useful in terms of distributing community income [11]. Government efforts to reduce electronic waste in MSMEs based on existing regulations really need to be considered and implemented. In general, every person and MSMEs will produce waste and must reduce it to maintain environmental quality.

Paying attention to the regulatory mandate regarding electronic waste management needs to be carried out in order to protect the environment, all parties producing specific waste must manage e-waste in accordance with the technical provisions that have been determined, as does the government. The governance of handling electronic goods which are state property is both a challenge and an opportunity for the government.

This is a challenge, because currently the implementation of this instrument does not touch specific waste originating from government offices and synergizes with regulations related to the management of state/regional property.

This is an opportunity, because currently there are only four companies/facilities that have permits to manage and utilize e-waste to be able to answer specific waste management mandates. The implementation of policy instruments must be able to grow new service business activities and expand employment opportunities that can contribute to the country's economy.

So that one day there is no accumulation of electronic waste, reduction methods that can be carried out are using the 3R principles in accordance with the guidelines for waste management, namely:

### **Reduce**

Currently, it is quite difficult for Indonesian people to reduce and limit electronic products that can minimize electronic waste. Apart from that, the reduce principle does not show results in a short time. There are efforts to limit waste generation, such as: reducing management costs, reducing the potential for pollution, extending the life of the landfill, reducing cleaning system facilities and saving the use of natural resources [12]. Likewise, with electronic waste management, electronic producers can limit generation. By limiting waste generation, a product can minimize the waste produced when the product is not reused. Minimizing the waste produced until the product cannot be reused, in waste management there is the From Cradle To Grave principle. So that when manufacturers release electronic products, the materials used are environmentally friendly and can minimize the generation of electronic waste. When electronic products cannot be reused, they can be recycled properly and minimize pollution to the environment or become new energy. Another advantage is that electronic products are long-lasting and can be recycled over time.

### **Recycle**

The concept of recycling is an activity that reuses products that have been reprocessed into new goods. So a waste sorting process is needed. The concept of recycling waste can change a product into the same product, a product into a low quality one, or even make a product into a superior product. So that recycling can minimize the accumulation of electronic waste scattered in household areas. Recycling electronic waste is also a target for recycling entrepreneurs. Because in an electronic product there are precious metals such as gold and silver in the manufacture of certain electronic goods. However, this process also uses other chemicals, so it has quite a high risk to the health of workers in this field. Therefore, the electronic waste recycling process must be carried out by licensed professionals. [13].

### **Reuse**

The concept of reusing electronic waste results in savings in waste generation. In reuse, there is an important factor, namely changing people's habits in carrying out this activity. This can be done by using used products/goods to obtain and increase their value. Apart from reducing waste generation, it also has economic value. Reusing electronic products that can no longer be used is a solution to minimizing the accumulation of electronic waste. Even though managing electronic waste on a home industrial scale is more common, you have to be careful. So that some of the dangerous contents contained in electronic waste do not harm the environment or human health. By exchanging electronic goods, you can also minimize accumulation. Even though there is innovation and technology in the latest electronic products, the process of exchanging electronic goods can be an alternative. This will really help in reducing the accumulation of electronic waste in household areas.

Managing electronic waste using the 3R principles is the main basis for reducing waste generation in MSME areas and is a good step to maintain environmental quality and provide adequate health for the community. Considering that electronic waste is waste that contains B3, the 3R principle in managing electronic waste can minimize the accumulation and generation of electronic waste in a place which can harm living creatures and currently its management can still be said to be imperfect. In fact, the problem of electronic waste is a serious matter for other countries so it must be dealt with appropriately. The advantage of using the 3R principle in managing specific waste is that it can minimize electronic waste going to landfill. In addition, remanaged electronic waste has economic value because some components of electronic devices contain gold and other valuable materials. However, to carry out further management, it cannot be done haphazardly. If it is not carried out according to permits, it is feared that it will pollute the environment and endanger workers who carry out management directly without adequate tools. For this reason, only the government gives special permits to B3 waste managers. The 3R principles are also often used in managing waste in general. However, it still requires awareness from various parties, especially the public, so that this principle can be implemented well even though waste management is the government's responsibility. Referring to the Waste Management Law, producers also have responsibility for the products they produce that cannot be decomposed by natural processes, thus requiring a product recall process, also known as Extended Producer Responsibility (EPR). The 3R principles and the EPR principles are both interconnected. This is because the Waste Management Law is the basis for using EPR principles in waste management [14]. These two principles have been explained in Minister of Environment Regulation No. 13 of 2012 concerning Guidelines for Implementing Reduce, Reuse and Recycle through Waste Banks.

Based on this regulation, the mechanism used is through a recall or take back system when a product has reached the end of its useful life from the public. In this case, the public is required to sort waste that has reached the end of its useful life to a designated place.

Based on PP No. 27 of 2020, the take back system is mandatory for producers who produce products containing B3 until further management can be carried out independently or in collaboration with electronic waste managers. Currently, the use of the take back system for waste management in Indonesia is not yet popular even though there are regulations governing the take back of waste containing B3. The health threat posed by electronic waste is also very dangerous for society. The chemical hazards contained in electronic waste can cause deadly diseases depending on the type and amount of chemical exposure either directly or through environmental media. Chemicals that are exposed directly are usually found in electronics service places. Even though it is not directly visible, continuing to have physical contact with hazardous materials from electronic waste can endanger human health [15].

Apart from direct exposure, chemicals contained in electronic waste can also enter the environment and threaten the health of local people because they can spread through air, water and soil. Therefore, sorting waste according to type starts from the household area as the community's first waste producer. By using the 3R principle in sorting waste or through waste banks in disposing of electronic waste, electronic waste can be minimized in landfills. Implementing electronic waste management requires a program that is designed as well as possible. Adequate human resources and the right technology to use in managing waste are very important in the success of electronic waste management. However, this requires very high production costs, skills and special training to operate it. Apart from that, the limited existence of electronic waste management facilities means that the government must choose the right policy for electronic waste management.

This is done to preserve the environment and minimize pollution caused by electronic waste. The public also has the right to participate directly or indirectly when the government issues regulations and decisions. So that the public can know and be able to manage electronic waste in accordance with the policies and regulations issued by the government. In general, electronic waste management in Indonesia is currently still mostly carried out by third parties in collaboration with the government. However, sorting specific waste from MSMEs by the community is very important. It is believed that the 3R program can currently reduce the generation of electronic waste, although its implementation is still not optimal, even though the 3R program has been established for a long time. So the government's main focus is on reducing waste problems in household areas by maximizing the 3R program. Based on performance achievements in waste management in West Java, it is still not optimal despite the 3R program, the Waste Bank has been around for a long time before the publication of PP No. 27 of 2020. In implementing the 3R principle, the use of drop boxes by the local government or electronics manufacturers, the use of waste banks and the utilization of 3R TPS has not yet been fully implemented. Apart from the importance of policies and regulations issued by the government, the importance of using recyclable

materials can influence the final process of electronic waste management. Electronic manufacturers are the main key players in producing environmentally friendly electronic products as well as in taking back waste that cannot be processed naturally. Because products that are initially environmentally friendly, when they become waste, will not have a serious impact on the environment and public health. The Cradle to Grave principle is a guideline for producers to produce products that are environmentally friendly when they become waste and safe until the final waste handling process. The government, as the person responsible for managing specific waste, is required to provide guidance and supervision to the community so that the reduction of electronic waste can run properly and the community gets a clean and healthy living environment. Even though it is still an obstacle for the government in managing electronic waste because it is hampered by a refocused budget and unequal APBD for each city and district, the government must have other solutions in reducing and handling waste. Because in the end, the goal of waste management to create a good and healthy living environment is a shared responsibility and requires good cooperation between the community, producers and the government..

#### **4. Conclusions**

The government's efforts to reduce electronic waste in MSMEs are based on existing regulations, namely by implementing the 3R principles, Reduce, Recycle and Reuse

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