

RADIO-ELECTRONIC DEVICES AS A SOURCE OF MUNICIPAL SOLID WASTE POLLUTION

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Анотація

У даній роботі радіоелектронні пристрої, які вийшли із вжитку, розглянуті, як джерело забруднення твердими побутовими відходами.

Ключові слова: радіоелектронний пристрій, джерело забруднення, тверді побутові відходи, сміттєвоз.

Annotation

In this paper, radio-electronic devices that have fallen into disuse are considered as a source of municipal solid waste contamination.

Keywords: radio-electronic device, source of pollution, municipal solid waste, garbage truck.

Introduction

In the modern world, the development and functioning of any state is impossible without the use of advanced information technologies (IT) and communication tools. The hardware of these technologies has different types and classes of electronic devices.

In recent years, Ukraine has seen rapid development of its infrastructure in the public administration sector, as well as in private companies and people's personal lives.

Modern IT technologies are characterized by active growth and development. An indispensable attribute of this development is the requirements for updating and upgrading the hardware component to maintain the necessary level and capabilities of information and telecommunications systems. New models of equipment are constantly appearing on the market, and opportunities and directions for using electronic tools in various spheres of life are growing.

Every year the problem of accumulation, neutralization and disposal of unnecessary computer equipment becomes more and more urgent, including for Ukraine [1].

Research results

The analysis of prices for electronic equipment recycling services by several specialized companies in Ukraine conducted in [2] shows a significant discrepancy in the cost of services between different organizations. This is due to the technology of processing such waste. According to the analysis of the current situation from a technical point of view, the technologies for recycling electronic waste in Ukraine that are currently working are quite simple (even in some cases primitive) and represent several options (or a combination of them): the smelting of precious metals with individual components, where this operation is quite simple and cost-effective; separation of metal parts (housings, radiators, cables, transformer windings, etc.) and their sale as scrap metal; in some cases, pyrolysis or burning of the combustible part.

This leaves a significant portion of the unutilized residue, which is most likely crushed without any sorting and sent to the landfill of solid waste. Thus, there is a risk that the processing technologies used today in Ukraine remain environmentally dangerous [1].

Every year, 11-13 million tons of municipal solid waste (MSW) are generated in Ukraine, most of which are taken out by garbage trucks to landfills [3-7]. The annual amount of waste per capita is about 300 kg, and there is a significant difference in waste generation rates between urban and rural areas. The increase in waste generation indicators is associated with an increase in the standard of living, taking into account the ratio between the dynamics of GDP per capita and the levels of specific waste generation.

According to various data, the level of MSW processing in Ukraine ranges from 3 to 8%, while for the European Union countries it is up to 60% of MSW (1). At the same time, more than 90% of MSW is sent to landfills and unauthorized landfills [8-13]. According to official estimates, 10,000 ha of land is occupied by about 6,700 landfills and landfills, although unofficial figures may be even higher.

However, according to the estimates of the Ministry of regional development, construction and housing of Ukraine, there is a need for at least 626 new solid waste landfills [14].

In addition to occupying land plots, such landfills emit greenhouse gases and pollutants that enter the atmosphere, surface soil layers, ground water and subsurface. This negatively affects the flora and fauna, as well as reduces the quality of life in nearby residential areas. The absence of separate collection and disposal of waste containing toxic components increases the risk of environmental contamination with dangerous substances.

Until recently, the economic component was not a decisive factor in determining the state's waste management strategy. However, the lost economic benefit from the lack of sustainable waste management is quite significant. According to UNO3 estimates, in 2011 the expected profit from recycling of paper was UAH 180 million, metals-UAH 225 million, and plastics-UAH 740 million for the year. In General, taking into account the production of heat and electricity, the economic effect can reach 1.3 billion rubles. UAH (130 million euros as of 2011).

Since the 2000s, the state leadership has adopted a number of legislative and regulatory acts aimed at systematizing waste management policies and achieving two goals, which are to reduce the negative impact on the environment and improve the efficiency of resource and energy use [14].

Due to the use of solid waste, a number of local and regional environmental protection problems can be solved:

- first, the area allocated for dumps is reduced, and useful land is used for the needs of the locality;
- secondly, thousands of tons of dangerous substances for the environment are involved in the case;

Analysis of literature sources has shown that the approaches used by developers of processing technologies are focused on the decomposition of compounds of a certain composition, and natural materials have a very diverse composition. It should be emphasized that there are quite a lot of approaches to technologies for utilization of difficult-to-dissolve titanium compounds, but they are developed for specific multi-component mineral compositions. It should be assumed that there is no single approach to solving the problem of recycling such compositions.

The analysis of the current state of e-waste management in Ukraine has resulted in the following conclusions and recommendations:

- in Ukraine, there is no official definition of the concept of "electronic waste" (stipulated in regulatory documents)»;
- there is no statistical information on quantitative and qualitative indicators of e-waste management, which is necessary, among other things, to assess the level of their real environmental hazard;
- the current system of control over such waste is imperfect and makes it easy enough to avoid responsibility;
- the existing control over the formation and handling of electronic waste applies only to the share of legal entities, electronic waste owned by individuals is not subject to any regulation at all;
- a small number of specialized enterprises engaged in the disposal and neutralization of electronic waste, there is no information about the applied technological solutions, their compliance with the current level and environmental requirements;
- lack of financial and economic mechanisms to stimulate the e-waste market;
- low awareness of owners of electronic waste (both legal entities and individuals) of possible ways of handling such waste and its potential environmental hazard;
- it is necessary to adopt and gradually implement the draft "Technical regulations for waste management of electronic and electrical equipment" developed by the Ministry of natural resources, develop and approve the necessary legislative and regulatory documents for its implementation;
- activation of work with equipment manufacturers can bring positive results. in many countries of the world, manufacturers are engaged in recycling their waste products.

Conclusions

Therefore, if the state regulates the legislation, thereby obliging all citizens to dispose of or recycle waste, then solid waste from electronic equipment has a chance to be reused or disposed of in an environmental way. Also, when using such methods, the state has the opportunity to receive additional funds.

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