ECOLOGICAL AND ECONOMIC ADVANTAGES OF RECYCLED METAL MATERIALS

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Annotation. Recycling is one of the most important tools in solving today's environmental and economic problems. This article highlights the importance of recycled materials in reducing the negative impact on the environment, saving energy and raw materials. It also analyzes the economic benefits of recycling, the possibilities of reducing production costs, creating jobs and using resources efficiently. The results of the study are presented in graphs and tables, and practical recommendations are given in the conclusions. The role of recycling in combating global climate change is also highlighted.

Keywords: Recycling, environmental safety, economic efficiency, energy conservation, waste reduction, resource conservation, environment, production, sustainable development, reuse.

Annotatsiya. Qayta ishlash bugungi kunning ekologik va iqtisodiy muammolarini hal etishning eng muhim vositalaridan biridir. Ushbu maqolada qayta ishlangan materiallarning atrof-muhitga salbiy ta'sirini kamaytirish, energiya va xom ashyoni tejashdagi ahamiyati ta'kidlangan. Shuningdek, u qayta ishlashning iqtisodiy foydasi, ishlab chiqarish tannarxini kamaytirish, ish o‘rinlarini yaratish va resurslardan samarali foydalanish imkoniyatlarini tahlil qiladi. Tadqiqot natijalari grafik va jadvallarda keltirilgan, xulosalarda amaliy tavsiyalar berilgan. Global iqlim o‘zgarishiga qarshi kurashda qayta ishlashning o‘rni ham ta’kidlangan.

Kalit so’zlar: Qayta ishlash, ekologik xavfsizlik, iqtisodiy samaradorlik, energiya tejash, chiqindilarni kamaytirish, resurslarni tejash, atrof-muhit, ishlab chiqarish, barqaror rivojlanish, qayta foydalanish.

Аннотация. Вторичная переработка является одним из важнейших инструментов решения современных экологических и экономических проблем. В статье подчеркивается важность вторичной переработки материалов в снижении негативного воздействия на окружающую среду, экономии энергии и сырья. Также анализируются экономические выгоды вторичной переработки, возможности снижения себестоимости продукции, создания рабочих мест и эффективного использования ресурсов. Результаты исследования представлены в графиках и таблицах, а в выводах даны

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практические рекомендации. Также подчеркивается роль вторичной переработки в борьбе с глобальным изменением климата.

Ключевые слова: Переработка отходов, экологическая безопасность, экономическая эффективность, энергосбережение, сокращение отходов, ресурсосбережение, окружающая среда, производство, устойчивое развитие, повторное использование.

Introduction:

Currently, the sharp increase in the amount of waste generated from industrial and consumer processes is of serious concern to the entire world community. In particular, global climate change, depletion of natural resources, energy supply problems and negative impacts on human health are becoming increasingly serious. In such conditions, ways to reuse existing materials through recycling are gaining urgent importance. Recycling reduces the volume of waste, saves energy and material resources, reduces production costs and reduces the negative impact on the environment. In particular, significant economic and environmental benefits can be achieved in the recycling of materials such as aluminum, plastic, paper, glass and steel. The introduction of recycling technologies contributes to the sustainable development of industrial sectors. At the same time, issues such as forming the environmental awareness of the population, establishing a culture of separate waste collection, and creating a modern recycling infrastructure are also on the agenda. The article presents the most important types of recycled materials, their economic and environmental indicators, analyses based on international experience, and recommendations for the development of the recycling industry in Uzbekistan.

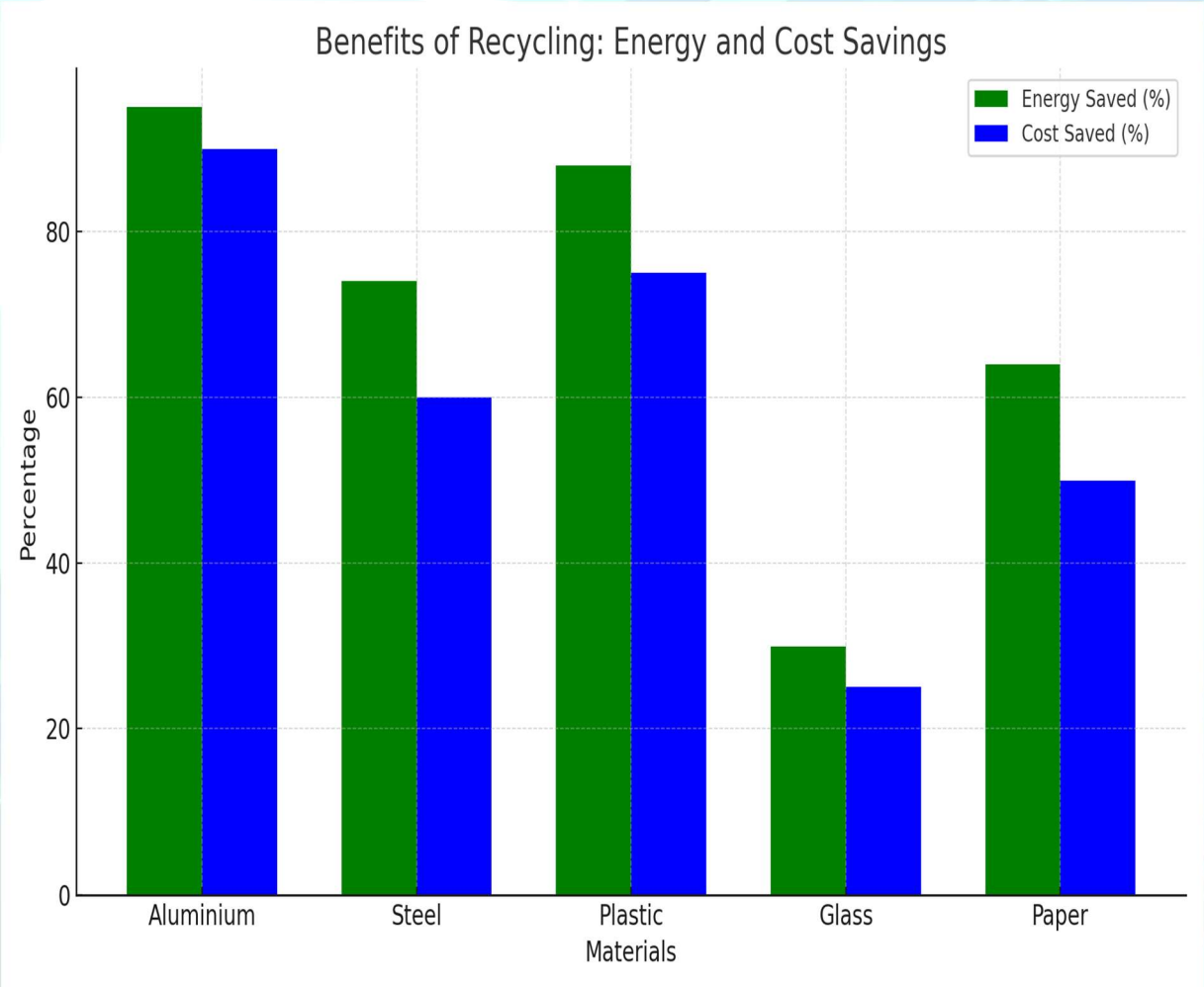
Research and method: This study systematically analyzed the environmental and economic benefits of recycled materials. The focus was on factors such as energy consumption, emissions, economic costs, and product efficiency of the recycling process. The study drew on statistical data from various countries, reports from international environmental organizations, practical experiences from recycling plants, and leading scientific articles. At the same time, the most common types of recycled materials — metal (mainly aluminum and steel), plastic, glass, paper, and cardboard — were studied separately. The energy and cost savings from recycling for each material were calculated and compared in tables and graphs.

This analytical study used qualitative and quantitative assessment methods. Qualitatively, the environmental benefits of each material, energy efficiency in recycling and waste reduction were studied. The quantitative approach was carried out by expressing the energy and cost savings for each material in percentage. The

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table below presents the economic and environmental indicators of recycled materials. Based on these results, a formal graph was also drawn, in which the energy and cost savings were expressed in English. The results of the study show that the greatest environmental benefits are observed in the recycling of aluminum and plastic. These results indicate the need to prioritize these materials in practice.

Material	Energy saving (%)	Cost savings (%)	Reduction of greenhouse gases (%)
Aluminum	95%	90%	97%
Send	74%	60%	86%
Plastic	88%	75%	70%
Bottle	30%	25%	30%
Paper	64%	50%	40%



Result and negotiation: The results of the study clearly showed that recycled materials have high environmental and economic efficiency. The greatest energy and cost savings were recorded for aluminum materials - 95% energy and 90% cost savings. This is due, firstly, to the complex and energy-intensive process of mining, smelting and refining the ore necessary for aluminum production.

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Recycled aluminum completely eliminates these stages and allows for the production of new products at low cost. Plastic is the leader in terms of environmental pollution, but its recycling can save 88% energy and 75% cost. These indicators indicate that modern industries should pay attention to these two materials, improving their collection and processing infrastructure.

The discussions revealed that the development of recycling technologies not only brings economic benefits, but also forms an ecological culture in society. For example, although the energy saving indicators of glass and paper materials are relatively low (30% and 64%), their recycling significantly reduces the volume of waste. In addition, many positive results are observed in this area of activity, such as job creation, internalization of cash flow in the economy through the processing of local raw materials, and reduction of external dependence. Some countries, in particular, Germany and Japan, have advanced experience in waste separation and recycling. Based on this experience, significant positive results can be achieved in Uzbekistan by separately collecting waste, increasing the number of recycling enterprises, and establishing incentive taxes and grants. The results of the study show that the recycling process should be considered not only as an environmental, but also as a long-term economic strategy.

Conclusion: Based on the above analytical studies, it can be said that the use of recycled materials should become an integral part of modern environmental and economic policy. The results of the study showed that the greatest energy and cost savings are observed in aluminum, steel and plastic materials, which serves as the basis for highlighting them as priority recyclable materials. As a result of recycling, the amount of waste is significantly reduced, greenhouse gases emitted into the atmosphere are reduced, and natural resources are preserved. In particular, through the secondary processing of materials such as plastic and aluminum, millions of tons of energy and billions of soums of economic benefit can be obtained. The recycling industry not only serves to protect the environment, but also to create new jobs, develop industry based on domestic resources, and ensure the stability of the country's economy. In addition, the widespread introduction of recycling processes can increase the ecological culture of the population, develop environmental education in schools and higher educational institutions, and form a sense of responsibility among citizens. These aspects confirm that recycling is a process of wide social, economic and ecological importance. Therefore, in the conditions of Uzbekistan, it is urgent to make the processing industry one of the priority areas of state policy, introduce modern technologies, strengthen the legislative framework, and systematically work with the population. In the future,

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it is proposed to conduct in-depth research in this area, develop a model based on local experience, and expand international cooperation.

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