RECYCLING OF RESOURCES AS THE ONE OF DIRECTIONS TO INCREASE THE PRODUCTION EFFICIENCY

Ph.D. **Shevchenko T.I., Kozlenko T.V.**
Sumy State University (Ukraine)

According to the research, that was done by Balatsky O.F. [1] approximately third part of all internal reserves efficiency of social production account to the share of increasing efficient using of natural resources. Enough important and large significance of this fraction refers to the direction of recyclable resources.

Recycling of resources provides a number of economic effects associated with saving material and energy resources, capital investments, reducing complexity, decreasing transport costs, as well as eco-economic effects that represent the prevention of economic damage from environment pollution. The value of the integral effect of recycling resources can be defined as the sum of the economic and eco-economic effects.

Economic efficiency of the using the recyclable resources is obvious, because the cost of obtaining primary resource significantly higher than the costs for resource-extraction of valuable components from waste with their subsequent processing for secondary resource.

For example, using recycling materials, the prime costs of secondary polyvinyl chloride, polyethylene, polystyrene are 2.5-6 times lower than their primary materials; 1 ton of recycled polyethylene saves 1.1 tons of ethylene, or 16.5 tons of oil; using in the blast furnace process instead of fuel oil the polymer wastes saves 40 % of petroleum products [2]. Also, with changing primary polymeric materials to the secondary materials, the prevented economic damage from pollution may arise because of: 1) allocation of wastes from polimer materials; 2) at the stage of production and processing of oil products, that were replaced by recycling resources; 3) during the production of electricity and materials, that are needed to produce oil; 4) during the production of polyethylene from the primary oil.

Plastic packages are the main plastic source (approximately 73%), while 54% used for food packaging. The plastic is being recycled (from 17% to 24%) and recovered (from 31% to 43%). LD, HD, PP and PET are main plastic products material (83%). Plastic recovery means the use of it in blast furnaces for energy production (44%) and in feedstock process (used for PET products) for chemical products recovery and recycling (54%) if new raw materials [3]. Reusable bottles can be made of steel, reusable plastic and some types of aluminum. This will save you money and keep waste out of landfill.

Most bottled water is packaged in PET, which is derived from crude oil and produces 3 tons of carbon dioxide for every tone of PET produced. Plastic bottles can take anywhere from 400–1000 years to break down. Three liters of water are needed to make a 1 liter plastic water bottle [4].

Concerning the metal: Using 1 thousand tons of scrap metal, there will be savings of 1.5 tons of ores and 0.2 tons of coke; the cost of collecting and processing of secondary raw materials is 25 times smaller than for the production of metal ores; for smelting steel from scrap there are requires electricity on 47-74 % less than at the smelting of iron ore; using the scrap in the manufacture of aluminum alloys reduces power consumption by 23 times, equivalent fuel by 7.4 times, specific capital investments by 8 times, direct costs by 2.5 times [4, 5].

Also, with the release of one thousand tons of steel from scrap iron, the air pollution is reduced by 86%, water pollution is reduced by 76%, and the amount of solid wastes are reduced by 92-97%. On the integrated assessment, shares of losses during the obtaining of ferrous metals from primary resource (in % of the production costs for 1 ton of metal) are: copper-46, nickel-56, aluminum is 18, leads in the amount of 19, zinc –12 [2, 5].

According to research conducted by the World Resources Institute (Washington), American companies make extensive use of resource-saving and environmental protection technology, believing that environmental pollution is wasteful for them [6]. Thus, companies that adopt different organizational schemes about reusing of natural resources and waste, enjoy certain

competitive advantages compared with other business entities. To summarize, it should be noted that the use of recyclable resources can be regarded as one of the ways to increase the utilization of material resources. In addition, the use of recyclable resources in the «production-consumption» produces ecological and economic results, which manifests itself in the form of avoided economic damage from pollution of the environment. It previously eliminated damage from using the primary resource instead of the secondary, as well as damage caused by waste disposal, that comprise resource-valuable components in the environment.

1. Balatsky O.F., Melnik L.G., Yakovlev A.F. Economy and the quality of the environment. Leningrad: Gidrometeoizdat, 1984. –191 p.

2. Shevchenko T.I. Organizational-economic bases of formation the ecological-oriented management system of secondary resources: dissertation for degree. Sumy, 2011. – 206 p.

3. European Commission DGXIE.3. European Packaging Waste Management systems 2010. – 30 p. http://ec.europa.eu/environment/waste/studies/packaging/epwms.pdf.-title from the screen.

4. Jenny Schmitt. Facts on Plastic Bottles and Bottled Water. 2011. – http://www.bottlesupglass.com/wp-content/uploads/2011/08/Facts-About-Plastic-Bottles-and-Bottled-Water.pdf.- title from the screen.

5. Ivanov O.V., Melnik L.G., Shepelenko A.N. In the fight with the dragon Koga. Experience of using nature in Japan. T: "Thought", 1991.– 239.

6. Potravny I.M., Sementchenko P.M. Resource conservation as a factor of sustainable development: Textbook.– Donetsk, 1997. – 31 p.

Shevchenko, T.I. Recycling of resources as the one of directions to increase the production efficiency [Текст] / T.I. Shevchenko, T.V. Kozlenko // Економічні проблеми сталого розвитку : матеріали Міжнародної науково-практичної конференції, присвяченої пам'яті проф. Балацького О.Ф., м. Суми, 6–8 травня 2014 р. / За заг. ред. О.В. Прокопенко. - Суми : СумДУ, 2014. - Т.1. - С. 37-39.