I. MAN AND BIOSPHERE

EFFECTIVE SYSTEM OF WASTE MANAGEMENT

Sergey Popov, Diana Savon, Petar Getsov, Garo Mardirossian, Stilian Stoyanov

Abstract: Ecologic-innovative process of social and economic development is directed on achievement of a standard state of environment at which functioning of the national economy, the region, branch, concrete production is carried out by rational use of all components of raw materials and energy, and ecological equilibrium isn't broken. In the recent article the attention is focused on use of the principle of the resource-saving being more favorable in economic and ecological aspect.

Key words: effective management, waste, waste management, production greening

1. INTRODUCTION

For effective management system of waste management is necessary to ensure compliance with the conditions of the functioning of this system using the concept of sustainable development [1, 6].

Currently, it is necessary to adhere to international standards promising to develop a strategy for sustainable development, which are an integral part of environmental aspects. Sustainable development in the understanding of conferences in Rio de Janeiro - is development that combines the steady improvement of economic and social conditions of life with long-term preservation of the natural foundations of this life [7–11].

It is proved that to improve environmental and economic efficiency is necessary to create the conditions in the field of waste production, to ensure minimal waste streams entering into the environment and to maximize the re-engagement in the sphere of material production of many types of waste [2–5].

Thus, one of the most important trends in the development of the concept of waste production, should be a consideration holistic environmental approach to economic growth, changing the type of technological development in the stable type. Necessary to change the existing economic paradigm, the new concept of the balanced and sustainable development to reduce global and local environmental risks.

2. CONTROL SYSTEM OF STREAMS OF PRODUCTION WASTES

In the conditions of transition to market economy the need for an effective control system of streams of production wastes sharply increased. It is expressed in a choice effective, from the point of view of economy and ecology, version of the address with waste. Important question of methodology of calculation of effective management of streams of waste is a system of consideration of the occurring phenomena. In this regard consideration of a problem of recycling from the point of view of system approach is advisable. Systemic approach to a problem of the address with

waste will allow change the situation which has developed now essentially. However consideration of a problem of the address with production wastes only from the point of view of system approach not enough, is necessary that this system satisfied to criteria of a sustainable development.

The problem of the address with production wastes is very difficult and interconnected. Development is necessary for the concept which would meet modern conditions of market managing for effective management of streams of waste such. It should be noted that today's technologies on neutralization of waste don't allow to refuse completely polygon burial, as it occurs in EU countries (full refusal of polygon burial in 2010, in some countries) nevertheless, the concept according to the address with waste has to be focused on development and introduction of processing technologies.

The main directions of creation small and waste-free productions are complex use of raw material and energy resources, development and deployment of essentially new technological processes without formation of waste; processing of all types of production wastes and consumption with receiving products; creation and release of new types of production taking into account requirements of its repeated use; creation closed water - and gas-reverse cycles.

Production wastes are unused substances and energy for which work in a certain public form is already spent. Therefore waste-free production and a recycling allow without essential increase in anthropogenic loading at natural systems to expand consumption of material and energy resources.

Thus, waste-free production is a method of production at which the raw materials and energy are made the most efficient use, and any impacts on environment don't break its normal functioning. As waste-free production understand ideal model of production which can be in most cases realized not fully and partially (from here – low-waste production). It is difficult to present absolutely waste-free production, but with development of

scientific and technical progress it is necessary to come nearer to ideal model as much as possible.

3. GREENING AS PRODUCTION RESTRUCTURING

The most radical direction of greening of production is production restructuring with division of a production cycle. This direction of greening has to find application in case anthropogenic load of environment is so great that the industrial region in which the enterprise is located, is carried to a zone of ecological catastrophe if other nature protection actions aren't capable to improve an ecological situation in the region. But implementation of restructuring requires existence of a technological capability of division of a production cycle on separate productions.

It isn't difficult to present that division of a production cycle represents a production deconcentration, in this regard it would be desirable to stop at first on the reasons which have caused the necessity for this process. Long time in economy there was a cult of concentration of production, the positive results caused by concentration, such as increase of production capacity, construction reduction in cost at the operating enterprises were comprehensively shined. However there was indifferently that fact that there is a threshold after which efficiency of concentration of production begins to decline. Increase of a limit of concentration of production leads to decrease in management efficiency by the enterprise, connected with difficulties of the organization and control of large-scale operations. Thus the economy from concentration of production can appear less, than the additional expenses connected with integration of the enterprise, for example, of expense for transportation of materials and finished goods, thereby there can be an increase in prime cost. Besides, with concentration growth anthropogenic influence of the enterprise increases and can reach the sizes at which environment loses ability to self-restoration.

One of the manifestations of concentration of production is such form of the organization of production as a combination which was widely adopted in metallurgy.

The essence of restructuring of production consists in division of a production cycle into separate independent productions and "carrying out" of some productions out of limits of this industrial region.

4. INSTRUMENTS OF GREENING

Providing some of tools and stimulation of greening of the production sphere, such as environmental

assessment, monitoring of surrounding environment, use of the clearing equipment, now already have application, others – need further study, creation of the economic mechanism of their introduction in production.

The instruments of regulation providing not only the measures directed on compulsion of managing subjects to environmental protection by standard regulation and penalties (a payment for natural resources, for pollution, penalties and economic sanctions for super limit consumption), but also measures of economic incentives of nature protection activity (a mode of the accelerated depreciation of ecoequipment, the preferential taxation, preferential crediting, etc.), and also the measures stimulating ecologically focused scientific and technological development of production have to be the integral component of an economic mechanism.

The purpose of development of such tools is increase of innovative activity of the enterprises of various forms of ownership in the field of economy greening.

Among the main problems here it is necessary to allocate development of basic bases of the motivational mechanism providing coordination of long-term and short-term objectives of development of a national economy, economic decisions at all levels of management in the conditions of the set loads of natural complexes.

At the heart of this mechanism there have to be such incentive motives which would provide identity of motivation of independently managing subjects to the principles of ecoinnovative development, an orientation of their scientific and technological and economic activity on satisfaction not only material, but also the spiritual needs which major part are needs for pure environment and its balance.

In these conditions the interrelation and interconditionality of economy of production with marketing, innovative and nature protection activity has to become the main kernel of strategy of long-term development of independently managing subjects. At mass application of mechanical technology by the main way of greening of economy increase of ecological qualities of production technologies is.

However high-quality shifts within this direction are connected with derivation of investments from the main production that can cause delay of rates of economic growth to what domestic and foreign experience testifies.

Nevertheless, at mechanical technology the principle of a low-waste can't be realized only in the conditions of one economic branch, at the level of certain independently managing subjects as

strengthening of their versatility, increase in the sizes and, as a result, reduction of flexibility, ability to the fast technological and organizational reorganization which is so necessary in modern economic conditions would be required. Basic changes in the territorial organization of production are required, for regions with high degree of "wear" of environment of possibility of accumulation of industrial potential will depend on creation of the regional technological systems providing production of several types of production at the minimum volume of substances at the exit and the fullest utilization of energy, involved in production (a complex of technologically interconnected productions in which waste of one production is used in other production cycles, that is serve as raw materials for the subsequent stage).

This direction often locates in scientific researches as the most cardinal; however it has, in our opinion, a number of restrictions.

First, as notes a number of researchers, from the point of view of the principles of thermodynamics, creation of waste-free technologies would mean violation of its fundamental beginnings, attempt to invent the perpetual motion machine. Not only energetically absolutely closed, waste-free technologies are theoretically impracticable as even natural cycles are closed only conditionally, and between them there is an exchange in all ecological components. Therefore the term "waste-free technology", in essence, characterizes a certain unattainable ideal, and really it is a question of a choice from all available set of that technology which possesses the maximum low-waste. Most essentially new technologies meet these requirements.

Secondly, greening of economy can't be considered as the linear process connected with replacement of outdated technologies on new waste-free, possessing bigger environmental friendliness. Introduction of separate technologies in traditional technological chains doesn't give essential shifts because of impracticality of the interfaced technological systems to advantages of these technologies.

The most radical direction of greening of economy is connected with replacement of the transformed subject of the nature used in mechanical technology as a means of labor, natural processes (physical, chemical, biological and others), allowing radically to change properties and qualities of substance, and not just its form. Essentially new production technologies based on structural changes in an object of the labor on molecular, nuclear and subatomic level are as a result formed. For such technologies in comparison with the traditional are characteristic higher resourcefulness and wastelessness that creates

prerequisites for creation of environmentally friendly and economically effective production.

However the lack of natural-science knowledge and mainly economical and technocratic approach to development of new technologies leads to that there are new environmental problems and contradictions. The new pollutants breaking quality of environment can be a consequence of new technologies. This circumstance does necessary "ecological maintenance" already at early stages of development of new technologies. Besides, use of new technologies leads to sharp increase of anthropogenic loads of natural systems at emergencies, and consequences of accidents of such technological systems are incomparable to adverse effects of operation of mechanical equipment and technology.

For definition of long-term and constant limits of steady consumption of materials and energy three rules are formulated:

- for renewable resources rates of consumption shouldn't exceed rates of regeneration;
- for not renewable - rates of consumption shouldn't exceed rates of their replacement by the renewable;
- for polluting substances limit intensity of emissions shouldn't exceed rates with which these substances are processed, absorbed or lose properties harmful to environment.

Implementation of these rules depends on intensity of processes of greening of economic and scientific and technological development and is connected with the changes happening in the world market which are caused by exhaustion of natural resources, toughening of rules of law in the field of environmental protection, environmental management and business. More rigid national rules of managing established by the state make essential changes to process of development and production, pricing, opportunity and a sale condition. Respectively, demand for ecologically focused scientific and technological development and technological innovations, ecotechnologies and the equipment increases.

The greatest success is achieved in the countries for which are characteristic high level of technological and industrial development; big population density, limitation of local, raw material resources; the developed transport, telecommunication networks and market infrastructure where the ecological right, the economic mechanism and the state scientific and technological policy stimulate development of products and the technologies meeting the modern ecological requirements. Characteristic example is Germany in which the market of ecological goods and services

represent today more than 4000 business operators with an annual turnover of 26 billion euro.

We analyzed situation with dangerous wastes of production in the some countries of the world (Fig. 1).

Dangerous wastes increased in 2009 in comparison with 2007 in Austria by 368,1 thousand tons, or for 38,3 %, in Belgium – on 1879,7 one thousand tons, or for 46,5 %, in Germany – on 617,8

one thousand tons, or for 2,8 %, in France – by 1271,3 thousand tons, or for 13,2 %. Decrease in dangerous wastes is noticeable by other countries.

Annually industrial enterprises of all countries of the world throw out in the atmosphere one million tons of polluting substances that is reflected in Table 1.

Fig. 1. Education dangerous waste in the certain countries (thousands of tons)

Table 1. Emissions in the atmosphere industrial enterprises of the countries of the world, one million tons

2012 year	Carbon dioxide	Carbon oxide	Sulfur dioxide	Nitrogen oxides	Freona	Lead	Dust	Ashes
	20000	200	200	50	1,0	0,4	250	200

As for Russia, the general for all territorial subjects of the Russian Federation a problem is practical lack of ranges of industrial wastes which are stored at the enterprises. As a whole about the country the quantity of unutilized waste is estimated approximately at 82 billion tons.

Thus, if in Europe more than 50 % of waste are processed, in Russia the average level of recycling of industrial wastes makes 35 %, and the firm household - no more than 4 %. For considerable part of industrial wastes methods of utilization and neutralization are absent or are expensive. Main types of not utilized dangerous wastes of the industry long time collected in the territory of the enterprises, their quantities exceeded long ago maximum permissible. On a number of the enterprises ways, places and periods of storage of dangerous wastes don't conform to requirements of the nature protection legislation. More than a half of

waste (55 %) is formed by the coal industry. Thus it is necessary to tell that no system improvement of a situation in Russia happens to waste.

5. CONCLUSION

For planning of measures for reduction of quantity of waste, to their use, neutralization and placement taking into account a condition of surrounding environment, and also level of social and economic development of territories federal and regional executive authorities develop respectively federal target programs and regional target programs in the field of the address with waste.

In system "resources - production - production - waste - impact on natural systems" a long time the main attention was paid to decrease in resource intensity of production. At ecologo-economic approach the attention has to be also concentrated on two last blocks. Thus, the waste has to be considered

not only as environment pollutants but also as valuable to economic system natural technogenic and technogenic resources, secondary raw materials, economic efficiency and ecological which safety of processing can be higher, than primary raw materials.

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ЕФЕКТИВНА СИСТЕМА ЗА УПРАВЛЕНИЕ НА ОТПАДЪЦИ

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Резюме: Еколово-иновационния процес на социално-икономическото развитие е насочен към достигане на нормативно състояние на околната среда, при което функционирането на стопанството, региона, отраслите, конкретното производство се осъществява при рационално използване на всички компоненти на суровините и енергията и не се нарушава екологичното равновесие. В статията се акцентира на използването на принципа на ресурсоспестяването, явяващ се по-изгоден в икономически и екологичен аспект.

Ключови думи: ефективно управление, отпадъци, управление на отпадъци, екологизация на производството

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