

МЕТОДОЛОГІЧНІ ПРИНЦИПИ МЕНЕДЖМЕНТУ ПЕРЕРОБКИ ВІДХОДІВ

Неефективне управління відходами та відсутність державного регулювання поводження з небезпечними відходами веде до подальшого незворотного порушення екологічної рівноваги і скороченню біорізноманіття. Інший наслідок подібної політики – це нераціональне використання не відновлювальних природних ресурсів у поєднанні з величезним накопиченим екологічним збитків. В даній статті вирішення проблеми поводження з небезпечними відходами розглядається як один з найважливіших пріоритетів національної політики, що забезпечують формування ефективної системи екологічної безпеки та формують стійкий розвиток регіональної економіки Хмельницької області України. Питання про формування ефективно функціонуючої національної системи управління небезпечними відходами має вирішуватися, на наш погляд, в рамках концепції національної безпеки в цілях створення національного багатокomпонентного інфраструктурного комплексу за прямої участі держави, що потребує розробки налагодженого і прозорого механізму правового регулювання діяльності держави і суспільства в цій сфері. Індустріальний сегмент існуючої системи поводження відходів на сьогодні тільки впроваджується в загальну систему господарювання в окремому регіоні Поділля.

JURIJ SHALAPKO, MALGORZATA ZAJDEL, JANUSZ MUSIAL
University of Technology and Life Sciences, Bydgoszcz, Poland

METHODOLOGICAL PRINCIPLES OF WASTE MANAGEMENT

Abstracts – Not effective waste management and a lack of government regulation of hazardous waste lead to further irreversible disruption of the ecological balance and biodiversity. Another consequence of such a policy – it is irrational use of natural resources n combined with huge accumulated environmental damage. In this paper, the problem of hazardous waste is considered as one of the most important priorities of the national policy, ensuring the formation of an effective system of environmental security and sustainable development form the regional economy Khmelnytsky region, Ukraine. The question of the formation of a well-functioning national hazardous waste management system should be addressed, in our view, under the concept of national security in order to create a multi-national infrastructure complex with the direct involvement of the state, which requires the development of well-functioning and transparent mechanism for the legal regulation of state and society in this area. The industrial segment of the existing waste treatment system is today just being introduced into the general system of management in a particular region of Ukraine.

Introduction. Ecology – the scientific sense – part of biology that studies the relationship between living things and their collections with each other and with the environment, structural and functional properties of ecological systems, the history of the formation, evolution, beneficial to human functions and their wise use. In the applied aspect, it is the base for the production of all sectors of the economy that exploit natural resources and impact on the natural environment and people's living conditions. Environmental security in the region – is to ensure compliance with existing or projected environmental conditions of the territory with international standards of environmental quality, the task of preserving human health, sustainable socio-economic development, protection and restoration of the environment. Environmental security combines the natural and technogenic components and must ensure the harmonious development of “farm-nature-man”. Management of ecological security of the region rather complicated process, but it allows you to keep the environmental situation under control, to develop the region's economy in an environmentally safety range. Collect and utilization of biogas from landfills help solve local environmental and energy problems. Obviously this is why Ukrainian business starts to develop ecological projects. For example, a landfill can be converted to the “headache” to source resources. Thus, well-known technology methane from landfills is used in Ukraine.

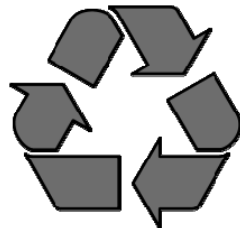


Fig. 1. International recycling symbol – the film Mobiusa

In Ukraine there are about 800 landfills (solid waste), 1,000 of them – unauthorized. Together, these dumps occupy about 3000 hectares. As a result of decay of pollutants into the air, soil, surface and ground water. Moreover, in the depths of the landfill biogas is formed, containing 40–70 % methane. Many meter accumulation of waste paper and remains moist food create ideal conditions for the development of methane-producing bacteria. Here, without oxygen and light, anaerobic bacteria decompose organic matter to form methane and heat.

The environmental situation in Khmelnytsky region. Urban growth leads to a steady reduction of the area of land with natural soils. More than half of the Khmelnytsky now occupy anthropogenic deposits (bulk, including soil bulk plants, artificial pavement, piles of excavation of mineral resources, cultural plane layer, alluvial, deposits of artificial reservoirs).



Fig. 2. Khmelnytsky landfill

Because getting additional amount of energy is physical technogenic pollution of soils and underlying rocks. Around sources of heat exposure (mains, reservoirs, cable tunnels) are formed domes thermal penetration zone warming of soil and groundwater at a depth of 60–100 m. Theoretical calculations have shown that the source of the temperature on the heat transfer surface 100 °C for 10 years of its existence creates around itself in sand and clay soils zone of high temperature (> 250 S) in width and 25 m area of heat transfer increases with groundwater. In clay soils with warming to 60 °C is the removal of the main mass of water. At 80°C significantly increases the corrosion rate and the number of microorganisms [3]. Due to the length of the heat communications can be said about the heat in Khmelnytsky contaminated an area of over 500 hectares.

Regarding soil contamination chemicals, the special surveillance in the area of influence of highways, businesses and other facilities of Khmelnytsky showed that all samples from 42 stations contents of heavy metals increased. Concentrations of lead in the streets Workers, Pilotska, Chernovola, Kamenets, Kuprina constituted 1,8–4,0 MAC (maximum allowable concentration), copper salts 1,1–3,6 MACs in samples of plants “Cation” and “Radio-technical” and municipal landfill (Fig. 2). In the latter area is also significant nitrate contamination of soils – to 3.9 MAC [4].

The undergone a radical transformation of human and plant and animal life. City increases its area by agricultural land, which replaced the steppes, meadows, oak and hornbeam forests. Deforestation, the residential and agricultural uses have greatly influenced the structure of the animal world. The main pollutants of surface waters are companies dairy and meat industry. In 1996 Pollution (hereinafter – the units MAC) Southern Bug organic matter at every observation was 1,9–2,7, 1,8–3,0 nitrites, iron salts 1,8–3,5. Maximum pollution – at “Chervona Zirka” (12 km from Khmelnytskyi downstream) in the area of influence of treatment facilities “Kmelnytskvodokanal” and Bohdanovcy plant of bakeries. Here the content of organic matter – 3.3, ammonium – 2.7, nitrites –60.0, –6.4 iron salts, copper – 2.4, zinc – 12.0. As the water content of iron ions is 6,5, N-NH₄ + –3,0, stiffness – 1.2 [2]. In 2011, the situation has not improved.

In Khmelnytsky and his surroundings a record level in the field of pollution easily oxidizing organic matter: 6.4 in Southern Bug River near Kopystyna, ammonium – 2,6–12,6 on the interval from the mouth Males from. Red Star, nitrates – 6,5–27,2 at the same Kopystyna. Oil pollution was 2–4 MAC. Near buckwheat and salt content Kopystyna 6-valent chromium in Southern Bug was 3–10 MAC, more than 6 times higher than the MCL salt content of iron near the dam on the Southern Bug (street Kamenet’ska) [1]. More than half of the air pollution accounts for transport. Especially loaded and thus polluted streets Kamenet’ska, Kuprina Chernovola, Proskurivska, Starokostyantynivske highway, Myrnogo, Kurchatova, Kotovskogo, Railway Station Square, Prospekt Mira. In 1997 he recorded excess of nitrogen oxides in 19.6 times, sulfur dioxide – in 1,1–2,9 [4]. In 2000, [1] the level of contamination by dust and phenol was 1,1–2,2 MACs, average monthly pollution and nitrogen oxides – 1,3–2,6 at maximum 8.1. Dominated permissible limits and the content of hydrogen chloride in the air – 1,3–3,5 MACs. In some months of sulfur dioxide pollution was 1.25 and carbon monoxide 3.6 MAC. That is, for some indicators (containing oxides of sulfur and nitrogen, for example), the situation improved. Features of the location of industrial facilities and urban infrastructure and topography (downtown lowest for the account of the floodplain and terraces of the Southern Bug, whereas relative altitude watersheds in the northern reaches 82 m) and climate (prevailing north-west transferring air masses) contribute to greater air pollution is on the right bank Southern Bug. Thus, the ecological situation in the city of Khmelnytsky characterized by a set of specific problems that need to be addressed by streamlining environmental management, improve environmental education and public responsibility.

National project “Clean City”. Khmelnytsky entered the top ten regional centers of Ukraine, which implemented a national project “Clean City”. This pilot project provides a new, not yet existing in Ukraine with the recycling industry. In the cities participating in the project will be built recycling plant with a deep level of processing – more than 50 %. While in Ukraine, there is no such plant, and the level of processing does not exceed 5 %.

Preliminary feasibility studies of the national project “Clean City” in Kyiv, Vinnytsia, Dnipropetrovsk, Kirovohrad, Poltava, Sumy, Ternopil, Kharkiv, Khmelnytsky, Chernivtsi indicative of technical and economic indicators approved by the Cabinet of Ministers of Ukraine dated August 8, 2012 p. № 695-p. The project in question aims to establish in Ukraine field of waste management. Its task is to build 10 new modern facilities for solid waste and implement innovative technologies for waste management.

The objectives pursued by the project include: comprehensive solution to the problem of environmental pollution and waste reduction in CO₂ emissions; reducing the volume of household waste disposed in landfills and landfills without prior processing; increase in the proportion of secondary resources are selected from MSW (municipal solid waste) for reuse in production; increasing the depth of processing of solid waste by 50 %; use of sorted waste with a calorific value as an alternative fuel. Only in 2010, Ukraine was formed 54 billion cubic meters of waste. Annual growth of volume of solid waste is 8 %. The share of secondary raw materials in the waste is 40–50 %, it is growing, and raw materials more expensive. As part of waste paper modern Ukrainian cities is 20 % food waste – 25 % glass – 12 % metal – 10 % plastic – 5 %, textiles – 4 %, wood – 3 %, leather, rubber – 3 %, other – 18 %. Today, 95 % of the waste stored without processing, but soon, tentatively in 2018, it will be illegal. Ukraine has virtually no garbage processing in urgent need of 100 waste processing plant and sorting lines 200–250. Lack of processing industry necessitated the implementation of pilot projects on waste processing plants. The mechanism involves the investment of building public-private partnerships and private investment. For construction payback is up to 10 years and the period of implementation of 2 years. Funding ranges from 30 to 60 million euro. o date, the project is at the stage of completion of the feasibility study. A source of return of investment resources is a separate rate for the processing, sale of secondary raw materials; sale of processed products (alternative fuel RDF), production and sale of electricity on the “green” and heat.

As of today, the project developers prepared a feasibility study for the project, developed the “Concept of solid waste in Khmelnytsky”, which outlines specific ways in the near future. In addition, a detailed morphological study, during which the city was dismantled 150 containers of waste are placed at different consumer groups, and 40 tons of waste at the city landfill disguised. Based on a detailed analysis of the data and selected appropriate technology that can be used to implement the project in our city. The technological part of the project completed by German and Poland experts, who have experience in how the project can be implemented.

The project envisages that in Khmelnytsky be built modern complex waste processing capacity of 100 thousand tons of recycling per year. Almost process occur as follows. Waste will be delivered to the garbage collecting complex, which will be selected partly organic secondary resources: waste paper, plastics, PET bottle, glass, ferrous and non-ferrous metals, whose fate is in our city, is about 15 %. However, a significant portion of contaminated textiles, paper, wood, etc. can be used for processing into alternative fuel. This will be used about 25 % of the waste generated within our city. Besides organic fraction (food waste, etc.) will be directed to a special shop for biogas production, which can be used for heat and electricity for both for its own use, and partly to market sources.

Local projects for Khmelnytsky. Since August 2012 in Khmelnytsky Region Company “BUD SI SISTEM” engaged in the export of pesticides from the territory of Ukraine abroad, began work on the collection, removal into barrels for disposal of unusable pesticides. Events held in the framework of the State program of treatment of hazardous (toxic) substances. Total available for utilization in the region unsuitable and prohibited the use of chemical plant protection allocated about 8 million UAH from the state budget and 2.742 million UAH from the regional budget’s. In the pace and timing make their adjustments are not always favorable weather conditions and the state of local roads, but despite the objective difficulties of planning and held deliberately. So with the start of the work has already been prepared for export (packed in Euro packaging that complies with the European requirements of environmental safety), about 250 tons of unusable and banned substances in the territory of Kamenetz-Podolsk, Chemerovets'ky, Derazhniansky, Belogorsky, Teofipolsky, Volochynsky, Polonsky and Slavuta regions.



Fig. 3. Electro boiler – design of Khmelnytsky National University

Area residents can win at relatively low electricity tariffs – on average 24–36 kopecks per kilowatt / hour for the urban population. These are general prices for everyone. If the consumer establishes a special counter and move to dual-zone fare calculation picture change. During the day will have to pay 43.8 kopecks, at night – 8.5 kopecks per kilowatt/hour. In addition, according to Energy, raised electric, mostly consumer's use at night, when the temperature decreases. Setting and battery electric boiler heat as water containers, water can be heated to 80 degrees of Celsius.

In Khmelnytsky National University developed electro boiler capacity of 5 kilowatts, which can heat the 60 “square” apartments. Incidentally, the unit is fully competitive and not inferior to the Russian counterpart. Khmelnytsky analogy is just one candy bar, and the “filling” consisting of parts Khmelnytsky manufacturers. Currently, university researchers complete the design and development of 18 35-kilowatt electric boilers for industrial and hope that his invention would have practical application (Fig.3)

Conclusions. A new level of management of hazardous waste, even on the scale of a particular region of Ukraine can be achieved with the following fundamental principles of management:

- a system of management of hazardous wastes and their treatment are an integral part of the overall system of environmental governance at all hierarchical levels of government;
- resource and environmental policy are balanced at the macro and micro levels of management in industry;
- business and environmental management agencies focused on mutual trust, responsibility and partnership, voluntary and flexible improving the environmental performance of enterprises;
- hazardous waste, the processes of their formation and the treatment they are considered at the level of facilities and economic activities of society;
- unclaimed and representing hazardous waste disposed of by means of closed-cycle processing (on specialized technological complexes) within a single system of organizational-economic regulation and infrastructure;
- resource and environmental indicators relating to hazardous waste, are an integral part of the environmental audit and considered in conjunction with the general complex of legal and organizational issues in this area and are included in the financial and economic analysis and evaluation of the company. Implementation of the proposed description of the methodological principles of hazardous waste management should ensure the formation and development of the system as a whole, including the modernization of the legal, financial, economic, administrative, infrastructure, research, human resources and education, awareness-raising and social events.

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