METHODOLOGICAL ISSUES OF FORMATION OF ENVIRONMENTAL RECYCLING MANAGEMENT SYSTEMS OF ORGANIZATIONS

Dariusz Soboń [1]

Ilya Stepanov [2]

[1] PhD, The Jacob of Paradies Univerisity in Gorzow Wielkopolski, Poland
e-mail: dsobon@ajp.edu.pl

[2] Corresponding author

Abstract: In the article on the basis of analysis and generalisation of modern scientific concepts of management of sustainable development of socio-ecological systems "utilisation - recycling of rubbish waste" THE socio-economic essence of ecological recycling management of organisations, its goals, tasks and peculiarities of formation and application is disclosed; conceptual provisions of the methodology of development of the model of organisation and management of recycling and waste utilisation are offered; peculiarities of their development on two main variants - internal and outsourcing are disclosed.

Keywords: recycling management, organisation, management system, justification methodology, principles and stages of development, waste management, recycling management, rubbish waste

Introduction

Increasing technogenic impacts of public production on the environment at present create objective prerequisites for a serious global environmental crisis. These processes put forward before the world community and companies the necessity to solve the problem of by-products and rubbish waste management in the chain of their production, transportation, processing, utilisation. In order to improve environmental performance, it is necessary to form environmental recycling management systems as an effective tool for solving this problem. At the same time, many issues of theory and methodology have not found sufficiently deep

discussion on the pages of scientific publications and in the practice of management in the chain of production - transportation - processing - utilisation of rubbish waste.

The complexity of solving this problem has caused the objective necessity to clarify and develop in this article a number of theoretical and methodological provisions of forming the concept of environmental recycling management system in the organisation

Methodology

The development and implementation of organisational and technological models of ecological recycling management, capable of providing eco-efficient and low-cost technologies for recycling and disposal of rubbish waste, requires the application of modern scientific concepts based on the latest achievements of organisational and management science and practice.

Diversity and large-scale processes of using natural resources in economic activity in the context of preventing, minimising and eliminating the consequences of environmental pollution by rubbish waste predetermined the application of innovative methods of socio-economic research and, in particular, the methods of abstract-logical, system-creative and heuristic analysis. As well as application of methodology of expert-project modelling of control systems of complex technological processes.

Results

According to the modern concept of rubbish waste recycling technological process is a complex technological cycle: collection - sorting - treatment - recycling - reuse of raw materials - utilisation, etc.

In the process of economic activity, enterprises interact with the natural environment and significantly affect its degradation and pollution. Minimising such negative impacts requires the development of science-based measures for greening, reducing negative human impact on the environment.

The greening of economic activities of enterprises should be understood as a system of measures that provide a noticeable reduction of technogenic impact of enterprises on the environment, including organisational and management measures. Environmental recycling management should play a significant role in solving this problem.

Nowadays, recycling and waste management is a vast network of different kinds of technological processes that support both basic production and the reuse of raw materials for the production of new types of products.

In modern science and practice, the role and importance of environmental management as a special management system for preserving the quality characteristics of the natural environment are immeasurably increasing. Environmental management systems represent an innovative approach to the development and implementation of modern management systems of organisations. One of its varieties, i.e. a specialised type of modern organisation management is environmental recycling management.

The need to form effective environmental recycling management systems is explained by the technological peculiarities of this process, when large-scale flows of rubbish waste, which take place in modern production, require deep consideration and differentiated approach in the choice of technologies for their collection, sorting, processing and disposal. First of all, these include wastes that are reusable (plastic, cardboard, wood, glass, metals, etc.).

The term "recycling" means a constantly repeating cycle of something. Thus, production and environmental recycling management means a constantly repeating cycle of management of environmentally safe processes of collection, recycling, utilisation of rubbish waste in order to produce new types of products from secondary resources. Application of the rubbish recycling model in the process of its application in practice requires the use of special technologies and special equipment.

Modern systems of ecological recycling management are complexes of interrelated and interacting measures in production-ecological territorial-technological chains of collection - sorting - processing - treatment - recycling - reuse of raw materials - utilisation, etc., developing in space according to certain regularities in order to solve the problem of preservation, minimisation of pollution and destruction, elimination of consequences and restoration of the natural environment on the basis of constant reproduction of natural resources.

Ecological recycling management studies objective regularities and principles of management in organisations of the processes of collection, storage, transportation, processing and disposal of technological production waste.

Environmental recycling management is a special subsystem in the organisation's management system, the purpose of which is to preserve the quality characteristics of the natural environment in the process of operation of the production subsystem on the basis of application of special technologies that ensure prevention, minimisation or elimination of pollution consequences.

The subject of environmental recycling management is a system of socio-economic managerial relations in the process of providing key characteristics to improve the efficiency of greening the enterprise's activities in order to preserve and expanded reproduction of the natural environment.

The goal of environmental recycling management is to create organisational and economic systems of enterprises capable of ensuring minimisation and prevention of environmental pollution and destruction, as well as quick and effective elimination of their consequences.

Ecological recycling management is aimed at ensuring balanced dynamic, sustainable and efficient functioning of enterprises on the basis of justification of management decisions capable of ensuring ecological and economic efficiency in the process of prevention, minimisation of negative impacts of the consequences of social production on the natural environment, as well as the elimination of its consequences.

Environmental recycling management systems have their specific hierarchy:

a) recycling management at the level of the state;

b) recycling management at the level of industries and spheres of production;

c) recycling management at the level of regions and municipalities;

d) recycling management at the level of enterprises, companies, corporations;

e) recycling management at the level of on-farm elements of the organisational structure of enterprises.

Despite the commonality of the general goal and key objectives of environmental recycling management systems at different hierarchical levels and scales, the degree of generality of models of their implementation, the goals, objectives and algorithms are embodied and detailed to a different degree differentiated on the basis of functional, technological, organisational, economic and managerial peculiarities. The closer the hierarchical level of the environmental recycling management system directly approaches the technological production processes of the enterprise.

Environmental recycling management systems are designed to provide management of the main elements of the organisational and management mechanism of its functioning and, above all, regulation:

- organisational-economic and organisational-technological relations regarding supply, storage and maintenance of other processes of the chain of production - processing - utilisation of rubbish waste on the basis of introduction of scientific and technical progress achievements in the technology of rubbish recycling,

taking into account the need to improve the processes of integration and cooperation between different enterprises;

- relations of interaction of all elements of the complex of reproduction processes on collection, sorting, storage, transport, processing and utilisation of rubbish waste in production and technological issues;
- organisational and technological relations between enterprises producing rubbish waste and enterprises-consumers of rubbish waste engaged in its processing and disposal;
- socio-economic relations between the management of waste generating enterprises and the personnel employed at them, as well as the management of waste consuming enterprises in the context of maintaining the balance of economic interests in solving their tasks, etc.

The application of technologies and models of rubbish recycling have an undeniable advantage over previous, archaic models.

Modern rubbish recycling models based on the principles of recycling contribute significantly to:

- conservation of natural resources by reducing the need to produce products from new natural raw materials;
- reducing the amount of rubbish waste that is sent to incinerators and landfills;
- prevention of additional environmental pollution in the process of production of new volumes of industrial products;
- reducing the need for additional energy capacity;
- increasing economic security as a result of the use of secondary domestic raw materials;
- creating new jobs in the processing and manufacturing industries, thereby increasing tax revenues to the budget;

Discussion

Models for organising and managing recycling and waste management are currently generally represented by two main options. One option is in-house management and the other is outsourcing, i.e. third party management.

The first option is internal management, where the organisation itself directly controls all recycling processes, i.e. auditing, sorting, storage, equipment, transporters, identification of final markets for sale, and customers purchasing waste and by-products.

In internal recycling management models, waste recycling processes are usually managed by managers-supervisors of the waste generating organisation. Their functions include analysing the qualitative characteristics of waste, identifying options for collection, transportation, recycling or disposal technologies, and selecting companies that consume waste or waste products. As a result of this analysis, a particular strategy for the promotion (logistics), processing, sale or disposal of waste is determined. Depending on the knowledge, experience, availability of social capital in the sphere of waste recycling and personal economic interests, the manager-supervisor makes managerial decisions on various options of collection, transportation, as well as directs and redirects waste flows, determines the entities that are responsible for the implementation of the recycling model proposed by him/her.

Another option is outsourcing, when external organisations are engaged to manage waste recycling processes. It should be noted that the formation of the modern concept of outsourcing in the system of environmental waste recycling management is one of the most important scientific and practical tasks.

Understanding of the modern rubbish waste market, having in mind its ever-expanding scale and complexity of the structure and assortment of rubbish waste, is currently impossible without changing the recycling management model in the environmental management system of rubbish waste that existed in the recent past. The point is that the development of integration processes between enterprises of different sectors of the economy and regional economic systems objectively requires the solution of the problem of transition in the management of rubbish waste recycling from individual single models (even if competent and professional decision-making by a manager-supervisor) to the model of project management on the basis of development and implementation of economic, inter-farm, regional and interregional complex target programmes of industrial (industrial) organisation.

In this regard, marketing plays an important role in ensuring effective management of waste recycling. Its task in the environmental recycling system is to help to find each other and to connect waste recyclers and waste disposal companies with their producers.

Marketing in the waste recycling system is aimed at studying sales (trade and commercial) activities in the waste market. It includes the study of the waste market, planning of assortment and pricing policy, stimulation of waste sales, organisation of waste movement to the enterprises for its processing and utilisation. Such marketing is designed to transfer the

processes of purchase and sale of waste and waste products, as well as recycling, into the system of market relations.

Marketing approaches to the management of ecological recycling of rubbish waste allow to provide enterprises both modernisation of their own internal capabilities for rubbish processing and justification of the most effective logical schemes of rubbish waste transportation to the enterprises of its processing and utilisation.

Marketing approaches contribute to the differentiation of technological relations on the basis of deepening specialisation, concentration, combination and cooperation in the process of implementation of rubbish recycling projects, and will also contribute to the deepening of the processes of social division of labour and cooperation both within and between individual firms, organisations, enterprises.

There are many economic advantages to applying an external rubbish recycling management model using outsourcing tools:

- firstly, there is no need to recruit additional employees to fulfil internal recycling functions and, therefore, the company saves a certain amount of financial resources both on additional employees directly and for their continuous training
- secondly, companies have a wide range of opportunities to access a large number of qualified human resources outside the companies themselves. It is outsourcing that gives companies the opportunity to provide their production processes with highly qualified specialists with the required qualifications, which would hardly be possible within the activities of a single organisation.

The major disadvantages of outsourcing include:

- lack of prompt and quality control by the waste generator company, which may negatively affect the expected quality of waste treatment and utilisation;
- communication problems in case of territorial location of enterprises processing and utilising raw materials in different time zones.[5]

The objective necessity of transition to a new flexible management model on the basis of outsourcing of rubbish recycling is caused by the fact that the former conservative and inert system of staff development has lost its relevance, because the model of its organisation no longer provided the necessary synchronisation to the constantly and rapidly changing characteristics of the organisation's activity on the principles of outsourcing.

The generalisation of practice convincingly proves the necessity of solving the problem of maintaining a high level of qualification of managerial personnel in the conditions of

constantly changing characteristics of management-outsourcing on the basis of the model of expert-project self-learning organisation. Such a model will allow to maintain the algorithm of training and acquisition of new professional knowledge and formation of competences and skills of personnel in accordance with the constantly changing conditions and requirements of recycling-management technologies, both at intra-organisational and inter-organisational levels.

The development and implementation of the concept and programme of a modern environmental recycling management system of an organisation is one of the complex problems of modern management of any company, as it requires the solution of a whole set of non-standard problems, starting from the analysis of the current state of the market of rubbish waste, logistics of its promotion to the objects of its further processing or disposal.

Generalisation of the best world experience and our own research have shown that the formation of a system of effective models-activities of ecological recycling-management in the chain of production collection - transportation - treatment - neutralisation - processing - disposal - utilisation of rubbish waste becomes possible, first of all, when taking into account the basic and specific principles-laws of the process of rubbish waste recycling.

The basic principles of forming environmental recycling management systems are:

- development and implementation of environmental recycling policy taking into account objectively existing conditions and circumstances;
- application by waste generating enterprises of modern highly efficient technologies that minimise the destructive impact on the natural environment;
- adaptation of enterprises to the existing infrastructure in the region that ensures efficient greening, recycling and waste disposal;
- organisation of highly effective management decisions at the enterprise to ensure minimisation of its technological impact on the qualitative characteristics of the environment;
- creation of environmental recycling management systems that ensure effective monitoring and control at all technological stages of the production process.

Specific principle-law principles include:

- the formation of measures of the environmental recycling management system should be justified on the basis of detailed consideration of the dynamics of qualitative changes, objective prerequisites and factors in systematic connection with the existing and developing models of territorial-technological organisation

of the waste processing and disposal process with the trends of introduction of scientific and technological progress in all elements of the production chain - processing - waste disposal;

- measures, methods and tools, organisational, economic and management mechanisms are based on the key provisions of the situational management methodology, according to which management systems in situations of uncertainty and turbulence should respond in real time to any manifestations and transformation of the external environment;
- environmental recycling management systems, all their elements function in close interdependence and interrelation. If one element falls out of the recycling system, unbalance occurs, disproportions are broken, resulting in disruption of technological processes in the production chain: collection - storage - processing - utilisation;
- effective formation and implementation of the system of environmental recycling management measures can be successfully implemented only if there is an adequate set of property relations in the economic system of society as a key and effective mechanism of ownership, disposal, appropriation and economic implementation of models and forms of ownership;
- high efficiency and effectiveness is predetermined by the level of human resources potential of both individual companies and the entire environmental recycling management system; these are, first of all, personal professional and moral-ethical qualities of managers, their socio-economic interests and potential opportunities. As a result, they determine the positive or negative in the development and efficiency of environmental recycling management systems.

Conclusion.

A special place in the development of environmental recycling management models belongs to the formation of innovative approaches based on the concept of outsourcing.

Development and implementation of effective projects of recycling waste management on the principles of outsourcing requires a step-by-step solution of a number of systematically interrelated organisational and management tasks, and first of all:

- analysing the waste market to assess further opportunities for the use of waste recycling by-products. This initial analysis of the quantitative and qualitative characteristics of waste by-products is necessary to determine strategies for their further recovery and utilisation;

- justification of the choice of effective partners (suppliers and consumers) in the waste recycling outsourcing management system, taking into account the recycling and disposal programmes and projects in place at these enterprises. This issue is especially important when making managerial decisions on transition to outsourcing of waste recycling. It is at this stage that special attention should be paid to the analysis of global, regional and industry trends and tendencies in the supply and demand for key components of rubbish waste by recycling enterprises and opportunities for their replacement or exclusion from the technological chains of rubbish recycling (transition to paper, cardboard, plastic packaging has significantly affected the change (reduction) of prices in the purchase and sale of rubbish waste. Such an analysis will allow, firstly, to solve the problem of structuring the pricing of rubbish waste sales in order to conclude equitable and fair contracts in the system of outsourcing management in rubbish recycling; secondly, to provide a forward-looking vision and adequate regulation of changes in the programmes of recycling and disposal of rubbish waste and to react flexibly to sharp changes and fluctuations in market prices and thus prevent the possible loss of effective partners;

- forecasting, identifying and evaluating possible options of increasing complexity in recycling chains of by-products and waste streams of economic activity, which may further complicate the choice of options for management decision-making based on the choice of the dilemma between a significant increase in the costs of processing and disposal of rubbish waste as a result of the introduction of expensive environmentally friendly technologies and the possibility of risks of environmental damage as a result of pollution of the natural environment by by-products and waste streams, and o

- improvement of the organisational structure of waste recycling management in connection with the change of functions and professional duties of employees directly and indirectly related to the process of transition from the model of intra-organisational management of waste recycling of organisations to the model of external management of outsourcing of waste recycling;

- formation of innovative effective model of intra-organisational training of managers, adequate to the processes of performing their new professional functions and responsibilities in connection with the change of functional and production structure, transformation of activities of managers of organisations in order to focus their activities on the solution of key management

tasks associated with the transition to management models of outsourcing recycling of rubbish waste.

List of references used

1. Wąsowicz Krzysztof, Familec Stanisław, Cielkowski Marcin. MUNICIPAL WASTE MANAGEMENT IN MODERN CITIES .- Kraków: Izd. of the Kraków University of Economics Foundation, 2018.- 396 p.;
2. Rakhimov, J.B. Towards the Question of the Necessity of Forming an Environmental Management System at the Enterprise // Economics. Sociology. Law. 2018. №1 (9). URL: https://cyberleninka.ru/article/n/k-voprosu-o-neobhodimosti-formirovaniya-sistemy-ekologicheskogo-menedzhmenta-na-predpriyatii
3. Stepanov, A.A.; Rybin, M.V.; Savina, M.V. Actual issues of the environmental and energy policy formation // Economic Systems. 2022. Vol. 15, No. 2 (57).- P.26-35
4. Environmental management: textbook for higher professional education / S.A. Izmalkova, I.L. Avdeeva, T.A. Golovina, S.S. Bakhtina, L.V. Parakhina. - Orel: FGBOU VPO "State University - UNPK", 2013. - 164 c.;
5. CR-White-Paper_-Recycling-Management_-Outsource-or-In-House. Date of circulation 02.06.2023.
6. Nekrasova L.A., Khristova A.V. THE FORMATION OF RESOURCE-SAVING MODEL OF ENTERPRISE DEVELOPMENT // Economics: realities of time. 2017. №2 (30). URL: https://cyberleninka.ru/article/n/the-formation-of-resource-saving-model-of-enterprise-development