

# Problems of Commercialization of Environmental Innovations at Industrial Enterprises

Olena Kanishchenko, Nataliia Chupryna, Antonina Bobkova, Natalya Andryeyeva, Valentyna Kozlovtseva

**Abstract:** *The problems of effective commercialization of environmental innovations in the management system of industrial enterprises of Ukraine are considered in the article. The research revealed a steady unwillingness and low interest of business entities to pay additional funds for the creation and implementation of scientific development. The relationship between the socialization of the economic environment of entrepreneurship and the increasing relevance of ensuring environmental protection and environmental safety of production by improving the management mechanism of using the latest environmental developments is characterized.*

**Keywords :** *Commercialization of Innovations; Environmental Development, Environmental Protection Management, Industrial Enterprises, Marketing Research.*

## I. INTRODUCTION

One of the hallmarks of successful development of a market economy is the presence of close research and production and commercial relations between market players. Intense scientific and technological progress influences the nature and specificity of relations between industrial enterprises and scientific institutions [1]. Scientific institutions are ready to sell their scientific and technological development to enterprises, and enterprises, in their turn, given the current environmental challenges and requirements for environmental safety, should be interested in the acquisition and use of advanced environmental technologies in the production and protection of the environment. But, unfortunately, businesses are not always materially interested and mentally prepared to incur additional environmental protection costs [2-3]. Ukrainian companies, in most cases, do not have the free working capital to buy new environmental developments.

The urgent need to improve the environmental situation in the country is a strong factor in influencing the state's

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regulatory policy on environmental safety. Also, environmental degradation can lead to a deterioration in the standard of living of the country's population and an increase in mortality and a decrease in fertility [4]. Global environmental problems can be solved only by improving the environmental situation of industrial enterprises, which are a threat to the country's environmental situation [5]. It is therefore necessary to recognize that the commercialization of environmental ideas and their effective implementation in industry is one of the effective tools for solving the environmental situation in the country.

This situation reinforces the need for commercialization of scientific development. The financial component of the problem lies in the reconciliation of the economic interests of the scientists who generate the innovations and the representatives of the business who need to bring the scientific achievements into production [6]. The solution of the problem should be implemented at the macro and macro levels in the conditions of creating an environmentally-friendly business environment and will increase the competitiveness of domestic production. In this regard, the topic of commercial evaluation of environmental innovations is becoming increasingly relevant.

*The purpose of the article* is to identify problems and opportunities for the effective commercialization of ecological development based on mutually beneficial cooperation of scientists and entrepreneurs in the process of creating and implementing innovations in production processes in order to reduce environmental threats.

## II. METHODOLOGY

The development of practical minds is increasingly provocative of environmental problems, which is necessary, the need for more effective mechanisms for changing environmental issues. Intensification of industrial virology and actualization of environmental threats of the wiki e Necessary problems of environmental safety. In the implementation of reforms even in the spheres of the economy of the country, it is crazy to bring to a new approach until the necessary requirements for the implementation of environmental deductions at industrial enterprises.

Ale Vinikae, a big meal is more important, who can learn more about the wisdom of their wine-goers and help them to get the most out of them in the process of virology. Conducting the audit by the method of nutrition showed that there is no particular disadvantage of interest in science and technology, and

## Problems of Commercialization of Environmental Innovations at Industrial Enterprises

there are mechanisms for efficient transmission and acquisition of scientific deductions.

The following was carried out by the method of expert interviews and questionnaire of two groups of respondents: 43 science and ecologists were included in the first group, they were engaged in generation of science achievements in science institutes of Ukraine, they were updated to another group, representatives of industrial enterprises of Ukraine and the CIS countries have been recruited. There is little evidence of the fact that there is a low level of economic factors in the basic economic and social satisfaction, the social vote and the competitiveness of the draws themselves and the effects of vikorstan.

Conducting marketing has shown that I have a bag (\$ 1000 and more) of high quality labor, and of course, I've got more work to do in order to improve the environmental situation. We are more interested in environmental and wine inspectors, they are able to sell them at least for commercial use and want to take advantage of them all, but at the same time they are satisfied with their return. In the preceding years, 43 scientists and ecologists took part, as representatives of the offensive countries: Bilorus, Kazakhstan, Norway, Ukraine, Tajikistan, Moldova, Kyrgyzstan. In the analysis of the stock, the double system is staked, most of which are positive - that is, assigned the value 1, most negative - 0. It allowed us to translate the most common in kilkisni.

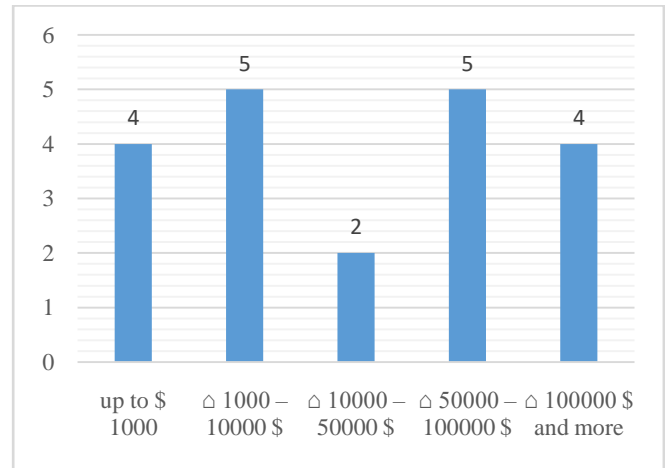
According to the results of the previous survey, the most recent: out of 43 nutritional respondents in the first group (science and ecologists), half of them didn't evaluate the commerce; 46.5% did not shy.

An analysis showed, generally in the market minds, and the need for power in general, for industrial enterprises in the country, an estimate of the commercial warehouse and its efficiency, which is an important aspect of the development of science. From the first side, most of them didn't commercially analyze their money, and we didn't know how much, we didn't want to see more than 50% of our respondents plan to conduct their own science in order to live. From our point of dawning, to achieve the great vision.

On the other stage of the accomplishment, in some cases they took the fate of more than that, they got to know their commercial vinogody, boules were signaled for the interruption, in some respondents they sold their robots.

If you don't want to come back from time to time, 20 respondents needed to sell their science products to companies, Ale, dumb, and they appreciated the business idea of 23 respondents. And by itself, we can make the gowns look better, 3 respondents - science experts evaluated the profitability of their ideas, but they didn't sell their winnings to the company's subsidiary furnishings.

The information about the great number of science and technology, for the sake of stench they sold their winemakers to enterprises was presented in Fig. 1.



**Fig. 1. Distribution of respondents' answers according to the price of inventions**

According to the research, the majority of respondents sold their inventions at prices ranging from \$ 1000 - \$ 10,000, and \$ 50,000 - \$ 100,000 for 5 people in each category, which is 25% for each item; the same number of answers was in the price categories up to \$ 1000 and more than \$ 100,000, which is 20 percent each interval. And, as we can see, the least of all, namely, two respondents, sold their inventions \$ 10,000-50000, which was 10% of the total sample of respondents, among those environmental scientists who sold their research.

According to the results of the analysis, it was determined by what law the distribution is structured. For this purpose, the relative frequency for each interval ( $w$ ), the length of the interval ( $l$ ), the height of the ordinates on the density graph and the average interval by which it is possible to smooth the graph of the density distribution of the cost of scientific development are calculated. The data are shown in Table 1.

**Table- I: Density distribution value (group 1)**

	Up to1000 \$	$\Delta$ 1000 - 10000 \$	$\Delta$ 10000 - 50000 \$	$\Delta$ 50000 - 100000 \$	$\Delta$ 100000 \$ and more
<b>n</b>	4	5	2	5	4
<b>w</b>	0,2	0,25	0,1	0,25	0,2
<b>l</b>	1000	9000	40000	50000	100000
<b>h</b>	0,0002	2,8E-05	2,5E-06	0,000005	2E-06
<b>x</b>	500	5000	29000	65000	100000

By calculating the values of the ordinate height on the density graph ( $h$ ) and the average interval ( $x$ ), we can plot the nature of the density distribution value (Fig. 2).

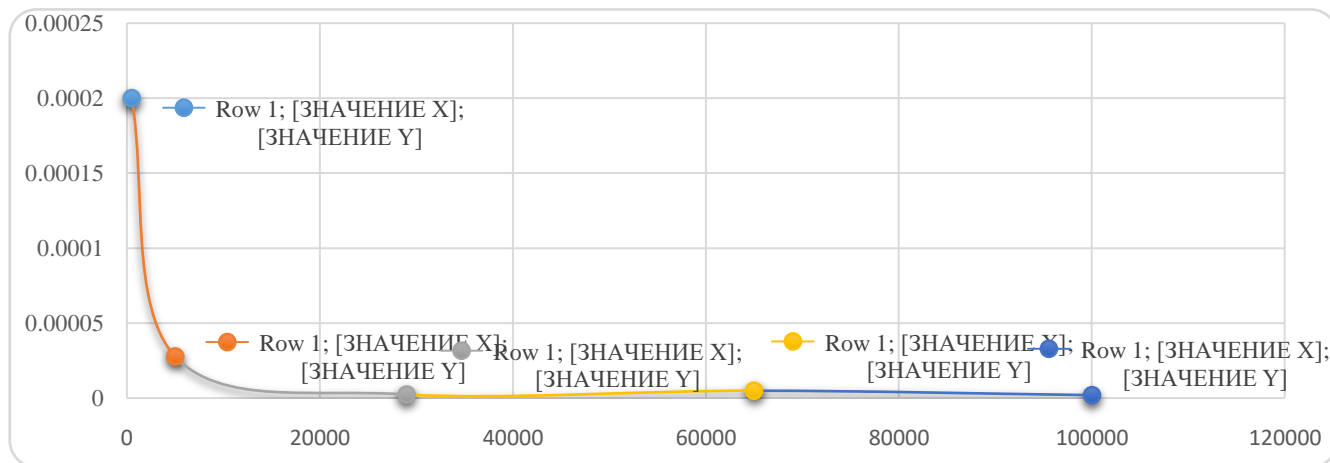


Fig. 2. The nature of the density distribution of the cost of scientific development in ecology (Group 1)

### III. RESULT AND DISCUSSION

Based on the results of the study and the above calculations, it is possible to assume an indicative distribution for the cost of scientific developments on environmental problems. It should be noted that statistics are not sufficient to determine the distribution parameters (in our case). The distribution shows that the greater the cost of development (x-axis), the less likely it is to hit a predetermined interval. Namely, the probability of falling into one or another interval is equal to the area above that interval.

Undoubtedly, carrying out research of two groups of respondents: scientists-ecologists and representatives of industrial enterprises, the next stage was the analysis of the enterprise's estimate of the cost of environmental development and how much the enterprise spent on it (from \$ 1000 and more).

It should be noted that in the study the price intervals of the two groups were chosen the same, to compare and compare the responses of the two groups of respondents. The binary system was eliminated, that is, the answers that were positive were assigned 1 and the answers that were negative were 0. This was done to translate the qualitative indicators into quantitative ones to improve further analysis.

The analysis showed that one of the respondents (7), who represented a machine-building industry, did not answer this question at all. There may be several reasons for refusing to answer this question, one of which is his ignorance of the issue. It is for this reason that further analysis analyzed the answers of 36 respondents, not 37. Also, it should be noted that only one of the respondents (15), who represented the metallurgical plant, indicated that his enterprise did not purchase environmental development but sold its price ranging from \$ 50,000 to \$ 100,000. That is, only 2.7% (1 person) of the respondents who represented industrial enterprises today are engaged in their own development not only to meet their needs, but can even make money from it. Another 97.3% of the surveyed respondents need scientific developments to address environmental issues.

But, unfortunately, only 13 respondents, namely 36.1% of respondents said that their enterprises estimated the economic value of environmental development, and the remaining 63.9% of respondents said no. This indicates that today most industrial enterprises are in an economic situation

that they cannot afford to buy and implement new environmental developments at the enterprise or have no incentive measures from the state to take such actions.

The next stage of the marketing survey was to analyze the responses of only those respondents whose businesses evaluated the commercial value of environmental ideas. It was calculated how much money they spent on the average to buy environmental products.

Analyzing these tables, we can see that 5 respondents did not answer the question: "At what price did your company sell / buy or purchase green development", although they confirmed that it was. These are respondents in the number 6 (chemical industry), 24 (metallurgy), 34 (chemical), 35 (refining) and 36 (metallurgy). We can see that these are representatives of industrial enterprises related to the chemical and petrochemical industry and metallurgy. There may be several reasons for rejecting this question, but the main ones, in our opinion, are the following:

- these data at the enterprise are considered to be commercial information and are not disclosed;
- the respondents did not know the correct answer to this question.

According to the research, we can say that only 8 respondents answered about the cost of environmental development. The results of the answers can be seen more clearly in Fig. 3.

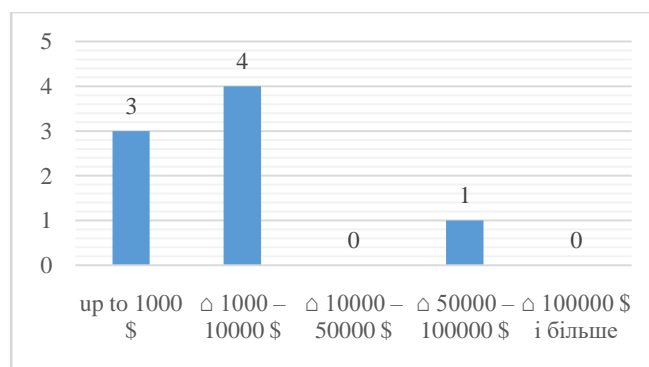


Fig. 3. Results of the second group of respondents' responses to the cost of ecological research

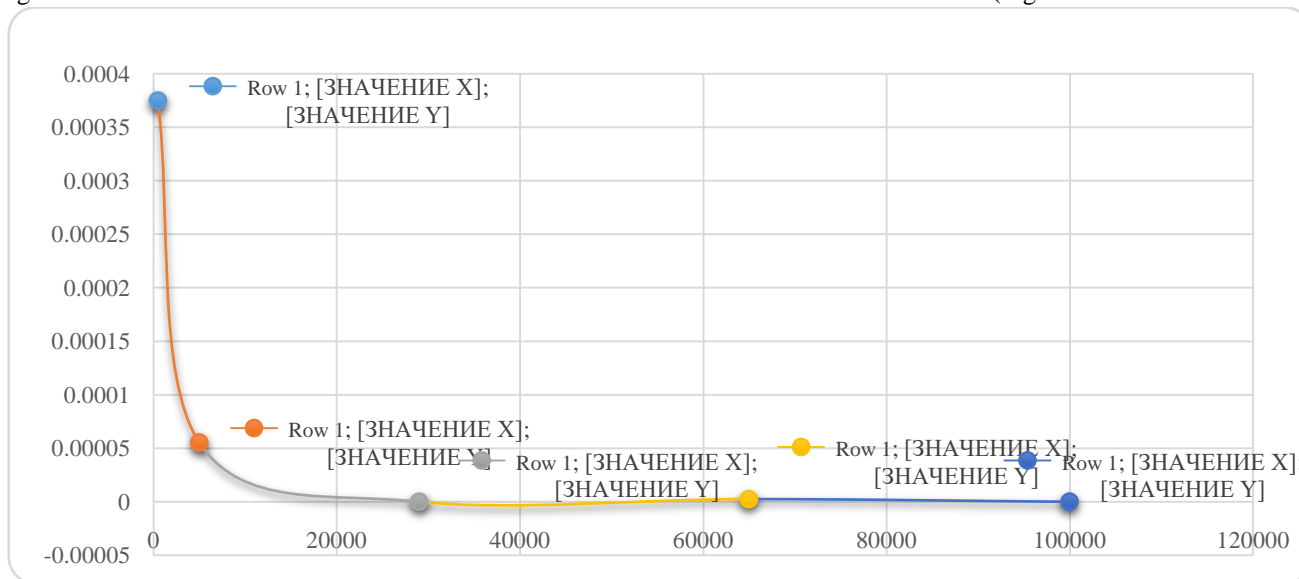
Note that none of the companies that participated in the study purchased scientific environmental development worth \$ 10,000 or more. One company, as mentioned above, has sold its scientific development in the range of \$ 50,000 to \$ 100,000. Four respondents replied that the company paid \$ 1,000 to \$ 10,000 for environmental inventions, and three companies paid up to \$ 1,000.

According to these data, the law of distribution of the value of environmental innovations at industrial enterprises was determined. To do this, the relative frequency for each interval (w), the length of the interval (l), the height of the ordinates on the density graph (h), and the average interval (x) for smoothing the graph are calculated. The calculations are given in Table 2.

**Table- II: Value distribution density (group 2)**

	Up to 1000 \$	△ 1000 – 10000 \$	△ 10000 – 50000 \$	△ 50000 – 100000 \$	△ 100000 \$ and more
n	3	4	0	1	0
w	0,375	0,5	0	0,125	0
l	1000	9000	40000	50000	100000
h	0,00038	5,6E-05	0	0,0000025	0
x	500	5000	29000	65000	100000

Based on the data in the table, we can construct a graph that characterizes the density of value distribution, where h is the ordinate height on the density graph and x is the average interval (Fig. 4).



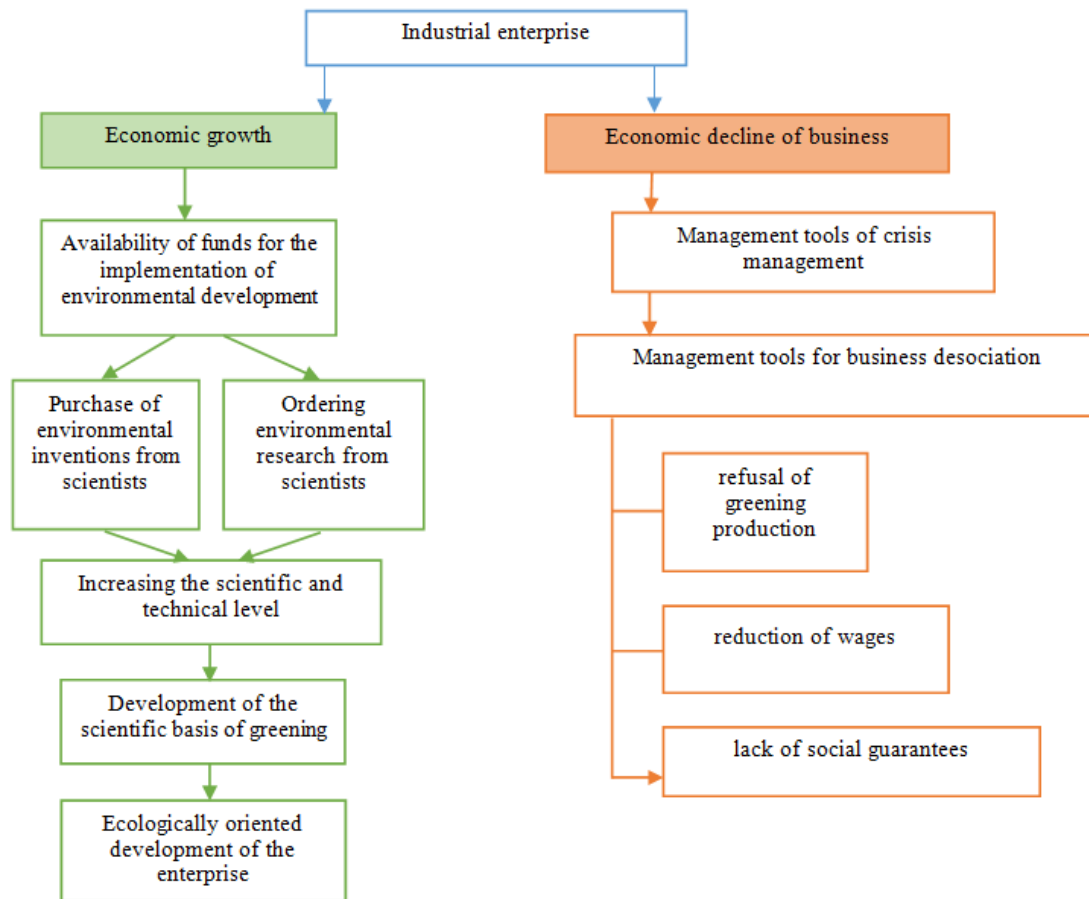
**Fig. 4. The nature of the density distribution of the cost of scientific development in ecology (Group 2)**

The analysis of this graph makes it possible to assume indicative distribution for the cost of scientific development in ecology. However, it is important to note that statistics are insufficient to determine distribution parameters. According to the received schedule, we will conclude that the more the cost of development, the less the enterprises of industry are ready to pay for them.

In times of crisis and lack of funds, industrial enterprises do not pay attention to environmental problems. Because of this, we can point out that the better the economic situation in the country, the more industrial enterprises pay attention to solving environmental problems and invest their (or attracted) funds in greening production (Figure 5). This, in turn, enables scientific organizations and scientists to sell their inventions and to receive orders for new research in the field of ecology and to develop the scientific potential of the country.

In this case, enterprises and scientific organizations (in the field of ecology) act as a whole, creating with the purpose of implementation of environmentally significant inventions. It is the intersection of their interests and gives positive effects from their cooperation. With the intervention of the state, the

benefits from the implementation of environmental inventions can be obtained much faster, and the very introduction into production can be accelerated and adjusted by government agencies.



**Fig. 5. Interacts with manufacturing enterprises and scientific organizations in the context of environmental management**

The company is engaged in the implementation of environmental development only in a stable situation, during its economic prosperity. Undoubtedly, the economic effect after the introduction of environmental development is in the first place for him. The transition to a market economy has shifted the priorities of industrial enterprises from social to economic ones. Without profit and positive dynamics of economic indicators, the company will have to cease operations. After that, employees, as well as their families, can be left without a livelihood - which is already a social component.

#### IV. CONCLUSION

Analyzing the data we received in the course of the study of two groups (1 group - environmental scientists; 2 group - representatives of industrial enterprises), when it came to answering questions about the value of green development and their purchase / sale, it was found that in both cases the law of distribution for the value of environmental we can accept demonstrative development, that is, the small cost of scientific development is much more common, and the greater the cost, the less it is encountered in practice. It is not possible to confirm this statistically and to give distribution parameters because statistics are not sufficient. But the existence of a demonstrative law of distribution is quite reasonable, because enterprises are not ready to pay large

sums for scientific development in the field of ecology, and, as a result, scientists, rather rarely commercialize their scientific inventions, put a high price on them.

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