






## Financing environmental protection projects in Ukraine

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The authors note that the "polluter pays" and "user pays" principles provide the direct application of the "polluter pays" principle and allows receiving 80% of all revenues to Ukrainian environmental funds, which are provided through pollution payments. The research shows that, on average, in Ukraine, the environment protection system's material costs were financed by 24.3% by the State in 2019. Territorial environmental funds and local budgets covered the rest. The authors pay attention to the practice of co-financing of the "brown" projects. It is unlikely that "brown" projects, which are not attractive to national investors, unlike "green" projects, will attract foreign investors' attention. The article highlights the critical function of the international financial institutions concerning mobilization of resources in international capital markets and providing loans to recipient countries, particularly those countries where there is a high degree of credit risk for private financial institutions.

**Key words:** ecology, environmental projects, "brown" and "green" projects, investments in environmental protection, international financial institutions.

### Introduction

There is a growing need to finance projects focused on improving environmental friendliness and energy efficiency in the current economic environment in today's circumstances. The world has already developed a direct connection between the business's investment attractiveness and its environmental friendliness and decreased carbon intensity and carbon dependence of the production economy. Leading exchange marketers, investment banks, and insurance and pension funds are increasingly refusing to finance companies whose working methods are far from environmental standards and are gradually withdrawing from the securities of representatives of entire sectors of the economy, which are considered environmentally depressed. Also, we want to live in a comfortable environment in every sense.

The business community is interested in expanding financial instruments for subsidizing so-called "green" projects. There are several options for supporting such programs: nowadays, this is lending and project financing and existing, and new mechanisms for issuing of green bonds are also being considered, including partial repayment by the state of coupon income paid by issuers and subsidized loans for implementation of projects to improve environmental friendliness and energy efficiency of production. In addition to traditional banking, it is possible to create joint ventures in implementing environmental and energy efficiency projects and provide highly qualified expertise in terms of compliance with the principles of responsible and sustainable development. It should be noted that many domestic and foreign scientists were involved in processes of creation and financing of environmental projects under the current conditions, like E. Brigham, J. Denkenberger, Houston, J. Pearce, G. Triantis, and H. Zielonka.

Nevertheless, modern environmental financing processes can not be considered perfect because of many obstacles to their development.

### Methodology.

The following methods of general and special scientific knowledge are used to solve the problems of research:

- Hypothetical and deductive one – to clarify the essence of the subject of the study;
- Synthesis one – to assess the existing mechanisms of financing of environmental projects in Ukraine;
- Categorical analysis – to justify the theoretical basis of financing environmental projects;
- Trend analysis – to monitor the distribution of financial resources to support environmental projects;

– Retrospective analysis – to assess the distribution of sources of financing of environmental projects in retrospect.

The research's information and analytical basis are the legislative and by-laws of the state regulating issues related to financing of environmental projects, scientific achievements of domestic and foreign researchers, statistical data of state authorities' own author's research.

## Results

During creating and implementing environmental policies, the State has the effective impact on an individual's behavior or a firm as its objective. Such policies can be implemented in various ways (increasing the level of taxation of environmentally harmful activities, adopting legislative acts on rationalization of non-ecological activities). The subsidies to promote environmentally beneficial actions or investments are other examples. Individual environmental policy activities may be included in sectoral programs (e.g., energy or agriculture).

Environmental policies and projects are organized into environmental programs. This tool provides an opportunity to better coordinate and link individual activities with available financial and material resources.

Macroeconomic policy has a noticeable and sometimes decisive impact on the environment, but environment improvement is rarely a priority goal of such policy. However, there are no absolute dogmas: in recent years, European countries have increasingly discussed tax reform's common problems aimed at improving natural resources use. The main idea of such "green" (eco-oriented) tax reforms is to increase taxes on resource use and taxes on pollution and to use the funds received to reduce labor taxes (primarily income tax). Simultaneously, improving natural resources use and increasing employment are being solved: cheaper labor is involved in the production. This effect is called a "double dividend" in the scientific literature (Daily, 1996; Admati & Fleiderer, 2009).

The "polluter pays" and "user pays" principles provide the direct application of the "polluter pays" principle and allows receiving 80 % of all revenues to Ukrainian environmental funds, which are provided through pollution payments.

The effective use of payments for the natural resources use (for example, fees for water supply and sanitation), based on the principle of full cost recovery, is primarily constrained by institutional infrastructure's weakness. This includes the absence of adequately developed contracts between water supply enterprises and consumers, which can be guaranteed.

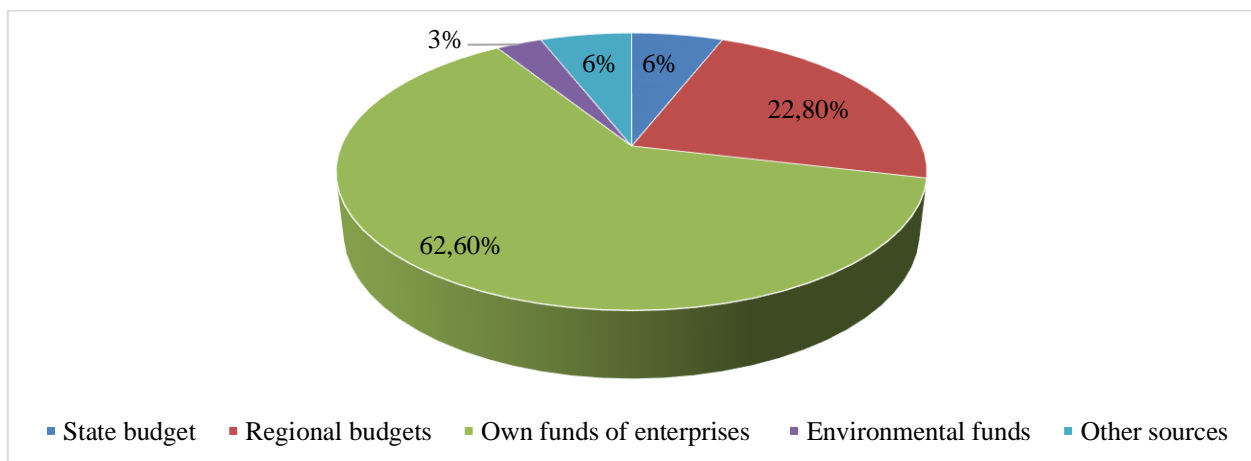
Besides, lack of user control over the service's quality hinders users' willingness to pay. Payments for the water resources' use do not compensate the costs of water supplying enterprises and do not ensure their material base development.

Considering commercial loans and the reserves of enterprises' funds, this makes it possible to expand the co-financing practice of the following "brown" projects.

1. When providing municipal services, "connecting" fees may be provided, which will become the starting capital for modernization or expansion of the capacity of treatment facilities. This option (single water supplying and water treatment organization) has already been mentioned above in the study of how to investigate the low willingness to pay for wastewater treatment.

2. Establishment of an environmental services company that will generate capital through the sale of securities.

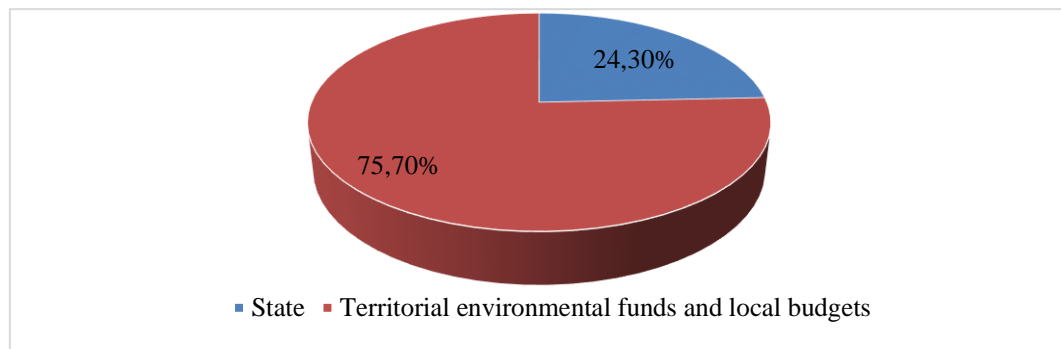
3. Playing at different "speeds" of turnover, for example, collecting advance payments for the provision of a service in combination with payment of rent (Hotchkiss, 1995; Leblanc et al., 2007).



**Fig. 1.** The distribution of investments for environmental protection in 2018.

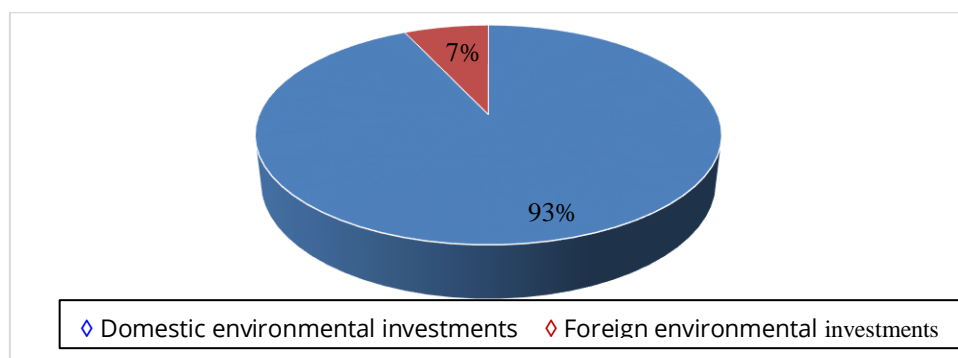
The official 2018 statistics for Ukraine show the following distribution of funds for investments in environmental protection measures (Fig. 1): State budget – 6 %, regional budgets – 22.8 %, own funds of enterprises – 62.6 %, environmental funds – 3 %, other sources – 6 % (<http://www.ukrstat.gov.ua>).

This distribution does not fully consider the system of offset payments for pollution; that is, it relates the expenses of eco-funds in the own funds of enterprises.



**Fig. 2.** The distribution of investments of the State and local budgets for environment protection in 2019.

An unambiguous conclusion can be made about increasing (absolute and relative) funding from the State budget in 2019. On average, in Ukraine, the environment protection system's material costs were financed by 24.3% by the State. The rest was covered by territorial environmental funds and local budgets (Fig. 2, <http://www.ukrstat.gov.ua>).



**Fig. 3.** The distribution of domestic and foreign sources for environment protection in 2019.

It is necessary to note that domestic (national) sources in 2019 provided 93% of all funds for environmental investments in Ukraine (Fig. 3, <http://www.ukrstat.gov.ua>). Almost all of these investments were directed to the implementation of "brown" projects.

It is unlikely that "brown" projects, which are not attractive to national investors, will attract foreign investors' attention. Most non-institutional international financing is non-World Bank-type financing from international financial institutions that appears to be from non-governmental organizations and is directed mainly towards green projects. An example is an exchange of "debts for nature" – the acquisition by World Wildlife Fund, a non-governmental environmental organization of part of the country's external debt (with a significant discount) for the country's commitment to implement green projects (Daily, 1996; Robinson, 2011).

In some cases, individuals and organizations buy or rent areas of environmental value to protect particular interest species. One example is the American Duckling Sports Organization (Dax Anlimiter), which has acquired large areas of swampy territory in Canada to ensure birds' safe breeding. Another example would be an investment group in Denmark that purchased forests in Scotland to ensure rare birds' safe reproduction.

In 1997, international financial institutions contributed less than 10 percent of all Ukraine investments for environmental projects. However, nowadays, international financial institutions finance almost entirely biodiversity-related projects (i.e., green projects) and over 70 percent of the costs of projects related to ozone-depleting substances.

In the face of economic and financial instability and chronic resource constraints, international financial institutions and donor countries themselves play a significant positive role in financing environmental activities. Over the past decade, more than \$1 billion has been spent on environmental protection and the management of natural resources from external financing sources. If it is not a grant application but a loan request, we should take into account that:

- International financial institutions do not fully finance projects, i.e., other sources of funds must be identified;
- Usually, a guarantee of the Government of Ukraine is required;
- The project should comply with international standards; that is, it should be implemented and paid off (Ruban, 2018; Ruban & Shvedun, 2019; Kropyvnytskyi et al., 2020).

A key function of the international financial institutions is to mobilize resources in international capital markets and provide loans to recipient countries, particularly those where there is a high degree of credit risk for private financial institutions. International financial institutions provide loans on more attractive and more favorable repayment times than those offering commercial loans. Some international financial institutions provide pro bono funding and guarantees, and all of them provide advisory services and technical assistance to recipient countries.

The European Bank for Reconstruction and Development (EBRD), part of the World Bank Group, operates only based on government guarantees, that is, loans are given to economic agents who are supported by government guarantees. About 75 % of World Bank loans are granted for special projects. The project should be technically feasible, have a high percentage of payback, and contribute to the country's economic growth and development (a period of up to 15 years is provided, a grace period of up to 5 years).

IBRD is actively involved in all stages of justification and lending of credit. The work is carried out according to the so-called project cycle scheme, which includes project identification, preparation, evaluation, negotiation, implementation, monitoring, and determination of results.

In Chernobyl, where the EBRD participates in the elimination of the environmental consequences of the 1986 nuclear accident, and in Kyiv, where the Bank financed the reconstruction of the city metro for the 2012 European Football Championship, EBRD helps Ukraine turn into a country with a robust, modern market economy.

Currently, the EBRD is implementing 166 projects in Ukraine totaling €1 billion 603 million. 44 % of projects involve assistance to private businesses. Some projects are somehow related to the green economy.

For example, the European Bank for Reconstruction and Development has been implementing the Program of Innovative Vouchers in Ukraine for the second year, which helps Ukrainian companies to implement their "green" ideas. Climate Innovation Vouchers were established under the EBRD Climate Change Technology and Finance Transfer Centre (FINTECC) program, funded by the European Union (Liming, 2009; Buslov et al., 2018). Nowadays, 26 Ukrainian companies have already received financial support under this program. The total investment amounted to €870 thousand. Recently, the "fourth wave" results were summed up, and from December 5, applications for the "fifth wave" (opened on the website [www.climate.biz](http://www.climate.biz)). The winning companies can receive up to 20 thousand euros. Besides, not as a loan, but as investment funds that will not have to be repaid. With these funds, they will cover up to 80% of the costs of implementing their green plans. The companies themselves should invest 20% of the funds.

Projects that help reduce the use of fossil fuels and increase the use of renewable energy sources, reduce greenhouse gas emissions, and facilitate adaptation to climate change are being accepted for the competition. Moreover, the project should have not only such an effect but also be an innovative one. What projects have a chance to get green investments? For example, one of the climate vouchers was received by the Meest Express postal service, which defended the Green Postal Logistics project. The essence of the project was to optimize the loading of machines and routes of mail machines. The technology offered allows coordinating trucks' loading and their movement on trunk routes in real-time. As a result, fewer cars will now be needed to transport the same amount of cargo, like fewer cars - less CO<sub>2</sub> emissions.

The Kyiv Company DS Electronics is developing devices for the smart home system. In this competition, this company won with a programmable thermal controller project, which can be controlled through a smartphone and can control energy consumption from anywhere in the world. The "Rotor-Sumy" enterprise specializes in mechanical engineering, but for the competition, it presented a microgeneration plant, which produces both heat and electricity from wooden pellets and biomass. The developers plan to establish such installations, which they hope will help save private houses, farmers, and small businesses. The European Investment Bank (EIB) presents loans on favorable terms, mainly for priority EU projects. Capital owners are EU member countries, each of which participates in it. The bank considers ecology one of its priorities. The maximum funding is a maximum of 50% of the project cost. The bank provides medium- and long-term loans, which depends on the essence of the project and investment facilities' life (Daily, 1996; Pearce, Denkenberger & Zielonka, 2009).

The EIB gives loans in mixed currencies or one, taking into account the borrower's interests and the convenience of transactions. Since the bank operates on a non-profit basis, the EIB loan interest is close to the price at which it traditionally borrows money in the capital market. Usually, loans are provided with a fixed interest set at the time of signing the documents, but in some cases, the interest is determined at each payment time. The bank requires certain guarantees from its borrowers, usually government ones.

Private funds may be spent on grants, such as the Rockefeller Foundation or the Mac Arthur Foundation, on environmental research, seminars and conferences, thematic reports, and investment. The latter may be provided from venture capital or investment funds. Venture funds participate in the formation of the authorized capital of the borrower enterprise. Existing examples indicate that loans are issued for 5 to 8 years and at 19 % per annum. Investment funds own shares of the borrower enterprise, which are the financial security of the investments provided for them. They also participate in an additional issue of shares. Bilateral and multilateral donors provide technical assistance, training, and investment support to developing countries on a pro bono basis. In particular, bilateral assistance programs are usually developed and implemented by cooperating with donor country institutions and relevant Ukrainian partner agencies. Such assistance is usually provided through a mechanism for financing agreed purchases of equipment.

The US Agency for International Development (AID) is a US state organization assisting countries with economies in transition, mainly on a free basis. As a part of the AMR project, the Harvard Institute developed environmental policy and economics issues for International Development. The joint Ukrainian-American Commission on Economic and Technological Cooperation considered lead pollution and the establishment of liability for past environmental damage during privatization. Organization for Economic Cooperation and Development (OECD) provides advice, research, and market relations in developing countries. OECD prepares regular reviews of environmental achievements. The Directorate for Environmental Protection of the Department of Non-OECD Countries is directly associated with developing countries (Robinson, 2001; Ahern, 2014).

The Project Preparation Committee (PPC) main objective is to identify priority environmental projects in developing countries, facilitate their financing through investment arrangements, catalyze overall investment policies, and use projects as demonstration examples. PPC helps to select and finance priority environmental projects, while its activities are based on the

principles laid down in the Program of Action for the Environment's Protection. Among the PPC projects are investment projects that are financed by two or more donors and/or international financial organizations (bilateral programs are the exception). Direct donor assistance is provided by donor countries (Denmark, Switzerland, Netherlands, Sweden, and Austria) by the invitation of experts and payment for consulting services, scientific and technical support, creation of information databases, dissemination of information, transfer of experience of developed countries, holding targeted seminars, and round tables.

## Conclusions

In general, to streamline the financing of environmental projects in Ukraine, it is necessary to develop an appropriate strategy consisting of four stages. The first stage is establishing an effective mechanism for promoting green principles in the economy. This phase includes some strategic and operational objectives. In particular, strategic objectives are the following: Identification of environmental objectives; Environmental risk management; Definition of financing principles; Allocation of resources. Operational objectives are technology selection, environmental control and monitoring activity, compliance with legal requirements, and internal documents.

The second preparatory phase includes analysis of the existing system of environmental management in Ukraine; development of unified environmental concept and policy; development of mechanisms for the participation of public authorities in solving of environmental problems; environmental risk analysis and assessment, critical risk identification; establishment and implementation of control over critically high risks.

The third phase, referred to as strategy development, includes developing an environmental strategy, developing balanced indicators of environmental efficiency, defining principles of financing of environmental programs, implementing the integrated risk management system, and describing the role of environmental departments in production business processes.

The final stage, implementation of the strategy, implies implementation of key environmental protection mechanisms, development of the process of internal and external interaction of environmental protection services, development of the organizational structure of environmental protection units, setting management accounting of environmental costs, development of an environmental training program and involvement of all levels of personnel in environmental issues.

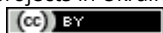
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