

# ANTI-CRISIS MANAGEMENT OF INTERNATIONAL INVESTMENTS IN ENERGY-EFFICIENT, RESOURCE-SAVING AND CLEAN TECHNOLOGIES<sup>1</sup>

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## ABSTRACT

*The article deals with the substantiation of reasonability regarding financial resources management, based on the "financial sustainability mechanism - the international business of energy efficient, resource saving and clean technologies", formalization of the main advantages and disadvantages of such management system, as well as finding its place in the enterprise crisis strategy. Special attention in the article is devoted to explaining the role of energy-efficient, resource-saving and clean technologies in this management concept, as well as identifying those problems related to such technologies implementation.*

**Keywords:** anti-crisis management, financial sustainability, energy efficient technologies, resource-saving technologies, international cooperation, investment, financial resources, sustainable development

**JEL Classification:** F20, F21, G19

## 1. INTRODUCTION

The scientific and technological revolution results open up unprecedented prospects to improving the environment and mitigating the effects of global climate change, which is consistent with the national interests of all countries – developed and developing. Resource conservation, energy efficiency and environmental protection, meeting sustainable development goals, are among one of the key priorities to which governments, international institutions and organisations, industries pays special attention.

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<sup>1</sup> The publication contains the results of research carried out within the framework of research works of the Ministry of Education and Science of Ukraine "Innovation management of energy efficient and resource saving technologies in Ukraine" (№ 0118U003571), "Innovative drivers of national economic security: structural modeling and forecasting" (№ 0117U003922), "Formation of the environmentally safe long-acting fertilizers based on the phosphate raw material" (№ 15.01.09-20/22 GP-01)

Prioritizing of financing projects aimed at energy and resource efficiency, environment protection, viability of urban and rural development facilitate the achievement of sustainable development goals. However, these processes require significant finance resources and huge investments, while access and availability to them is a major challenge for many countries taking in account the devastating global recession delivered by the pandemic.

Competition for temporarily free financial resources often demands that companies trying to attract them abandon priority planned levels of profitability in order to offer more favourable conditions for investors. According to these positions, the search for internal reserves of additional funding, which is undoubtedly cheaper and, in some cases, more efficient, is of increasing scientific and practical interest. As far as investment on environmental technologies is concerned, it should be noted that not only do such investments tends to have an extremely long payback period, but also be completely unprofitable. Being highly efficient ecologically, investments aimed at energy and resource efficiency and environmental protection could be economically inefficient. Therefore, in order to justify efficiency of the environmental investments, it is an assessment of their ecological and economic efficiency that should be carried out.

Moreover, formation of the organizational and economic mechanism of anti-crisis management of funding the projects on advanced technologies, based on international cooperation and public and privacy partnership should be done. Furthermore, the concept, which could be a solution to the problems of funding, is an approach to financial resource management based on the mechanism "Financial Sustainability – International Business – Sustainable Development". This article is devoted to the formation of this fundamental concept, as well as the justification of its reasonability.

## **2. GENERATION OF THE DATA**

Fundamental issues of ecological and economic sustainability at global and national levels has been examined in papers [3, 15, 17]. In particularly, in the work [3] it has been stated, that it is motivation which is the key factor of economy ecologization. Basic grounds to form motivational constituent of the international ecological policy have been developed in [17]. According to [17], the necessity to consider motivating constituent in case of environmental management is preconditioned by the fact that economic and even soci-ecological-economic efficiency of the ecodestructive activity is often higher, than economic efficiency of its ecological directions (where innovative development ecologization is the most priority).

However, as the authors [15] highlight, that the balance of social and economic interests between government and business-structures should be provided by mechanisms of public-private partnership. Moreover, in case of state ownership of the natural resources it is an efficient mean of financing environmental protection projects.

The idea of cooperation has been considered in [10] where the financial and raw material resources of small farms within energy co-operatives is proposed to combine.

In work [20] crowdfunding has been regarded as a novel modern financial instruments, which is different from the traditional forms of collective financing of environmental projects.

The reasonability to use the integral architectonics of the economy financial regulation of the State

and local budgets have been outlined in [8]. To prove marginal conditions of the costs' regulation of Ukraine]. Fundamentals of the budget regulation of intergovernmental transfers based on the level of financial resources generated in the area per capita and the level of its budgetary provisions have been provided in [19].

Some other instruments of anti-crisis management are considered in scientific researches widely. Particularly, in [18] leasing transactions has been regarded as an efficient tool of projects funding in the context of innovative agricultural development based on international and cross-sectoral technology transfer.

Problems regarding the internal reserves search to release financial resources, are reflected in the context of anti-crisis management of enterprises and its financial aspect in the work [2]. Focusing on relevant scientific papers in this area, it should be note research conducted by S.M. Illiashenko [5] where the comprehensive approaches to diagnostics and analysis of company's innovative development potential on the basis of ecological innovations has been generated.

Some aspects of the energy efficient technologies implementation have been reflected reflected in the works: [4, 7, 11, 21, 23].

Specify of counter-crisis management of energy efficient technologies has been outlined in paper [7]. Recommendations for improving financing and other economic mechanisms to motivation of renewable energy development in Ukraine have been suggested in [11, 23].

Although the problems of the financial resources management both in normal and in crisis conditions, as well as justification of the investments feasibility in energy-saving technologies, have been scientifically investigated, the issue regarding formation of the specific anti-crisis management mechanism of the enterprises' financial resources engaged in international economic activity, which would provide the release of funds and their further investment in resource-saving technologies, has not been solved yet.

The aim of the article is to study the directions of financial resources management at the enterprise, based on the mechanism "Financial sustainability – international business – Sustainable development" and the basic approaches formation to construct such mechanism.

### **3. RESULTS**

Nowadays, the economic development of the enterprise is extremely complicated by the lack of own financial resources. It demands from managers of permanent activities to find and attract financial resources. Expansion of production, improvement of the material and technical base, an increase of basic activity efficiency require more and more financial injections every year. In this context, the traditional sources to accumulate additional financial resources are the attraction of external investments, bank lending and leasing.

However, along with the undeniable advantages of external financing sources, in particular: the ability to repay the principal amount of debt from the sale of goods or by the goods produced on the equipment given by the borrower (corporate lending); the relative ease of attracting (for bank lending), obtaining under more loyal terms of obtaining funds (attracting an outside investor), the ability temporarily to use the equipment or structures without direct purchase (leasing), etc., have a number

of significant disadvantages:

- regarding corporate lending – firstly, not all types of equipment can be the corporate lending object, since the term to grant such credit in international practice is 3-5 years (the term exceeding 5-6 years has already been considered as an investment) [2];
- regarding bank lending - exclusively for the intended purpose, the need to repay debt and interest payments within a clearly defined period of time, the penalties for late repayment of the debt, the difficulty to attract large amounts of lending through the restrictions imposed on banks, the complexity of syndicated lending mechanisms, etc.
- in the context of attracting an outside investor: a) the necessity to ensure minimum requirements, which are set by investors (different for each investor). It does not only limit the managerial independence of the enterprise but it also often requires a major structural adjustment, which requires extra costs and changes that business owners may or may not want; b) investing in securities of an enterprise creates conditions in which investors from an external source of financial resources are actually transformed into owners; c) the necessity to reimburse investments, which reduces the effective activity indicators, etc. ;
- in the context of leasing: usually, leasing is extremely limited in time (up to 5-6 years) due to the physical wear and tear of the equipment. It means that complex equipment, robotics, energy-efficient technologies, production lines, the warranty period of which is about 10 years, cannot be leased [2].

According to these positions, in our minds, the most effective sources of financial resources to solve the problems are our own financial resources, released from the main activity or saved on improving the efficiency of production or management and administrative activities.

It is an extremely difficult choice for every business, since the release of financial resources can mean a decrease in product quality due to savings on raw materials, a reduction in production capacity, which leads to a decrease in output, which means lower sales, and therefore profits.

Under such conditions, we propose to release additional financial resources by investing effectively in energy-saving and resource-saving technologies. Within the framework of our study, we propose to define the energy-efficient and resource-saving technologies as technologies and equipment that help reduce consumption of energy, raw materials, materials and labour, through more improved physical processes [14].

Another issue to be solved in the range of problems is to explain why we consider just international business. The fact is that companies, engaged in international trade activities (export-import operations):

1) have a stable source of foreign currency, and therefore financing of the projects related to quality restructuring and updating of the material and technical base are deprived of the necessity to convert the profit, obtained in national currency, into foreign and, consequently, financial losses in currency exchange. In addition, foreign currency revenue is less risky of receiving foreign currency bank loans, which are typically provided at lower interest rates.

Obviously, enterprises oriented towards the domestic market do not have this advantage. Receiving the profit in the national currency (if the currency of the source country is not the key - reserve), the enterprise must convert a part of it for the needs of the internal investment projects implementation. In

the unstable situation in the country (when, for example, the exchange rate fluctuates quickly) it can be problematic to generate the necessary volume of the financial resources. Besides, even if the engineering consulting, trading services of exclusively national companies are principally used, in particular for Ukrainian companies, in any case, it is impossible to save financial resources because the equipment and materials by such companies are also purchased in foreign currency;

2) are more flexible in terms of adapting to international standards on quality, safety and corporate social responsibility, since they are compelled to adhere to the core activities of those standards adopted in source countries of their partner. In particular, the procedure of Great Britain leaving the European Union (the so-called Brexit) is controversial. Regardless of the fact whether Brexit will take place, or not, the enterprises from Great Britain will have to follow all standards, ratified by the European Union, in trade and cooperation with scientific and trading partners.

The enterprises, that were focused on domestic markets in the past, were clearly operating under national standards. It means that not only can their reorientation mean a change in administrative approaches to the business organization but also production ones. That is why the allocation of free funds for the investment projects implementation is complicated;

3) get a closer relationship with foreign partners, and therefore it is more accessible for them to borrow more effective experience in the organization of production, to use energy and resource-saving technologies (benchmarking elements), to cooperate with investors, foreign banks, international financial and credit institutions;

4) take part in international technology transfer processes. Orientation to international economic relations does not only open opportunities for expanding trade potential but also gives a strong impetus to get acquainted with the latest achievements of world technological progress. Participation in various exhibitions, seminars, round tables, practical courses, lectures - all this helps to raise awareness of administrative and production staff, which certainly has a positive effect to ensure the development of their own production in the high-quality growth direction and adhere to the sustainable development ideas [24].

In our opinion, investing in such technologies has several advantages that are significant for each enterprise, namely:

- it creates conditions in which an enterprise does not depend on external financing, which allows not only the financial resources release but also has a significant anti-crisis effect [13]. Financial resources, which are released through the improvement of technological, administrative and managerial, various auxiliary processes, as well as savings on the use of energy resources, make it possible to:
- obtain financial and economic potential to pay off debts - previous loans, tax arrears, excise duties, customs duties, arrears to employees and social insurance funds, etc .;
- level out the impact of certain exogenous factors on the enterprise - the general recession in the economy, inflation, interest rate fluctuations, etc .;
- to form separate funds for technical reequipment, which can also be directed to the intensification of efforts to strengthen fuel and energy and resource independence. Our study regarding car energy efficiency of the KIA Motors Corporation gives us every reason to claim that a fleet of 40 electric cars

saves up to \$ 80,000 a year, compared to classic powerplant cars, provided the original cost of the new cars is the same (identical equipment) and with an average annual mileage of about 30 thousand km (taxi service, delivery service). It lets not only to purchase 2 new cars each year but also to carry out annual maintenance support of the park only at the saved money expense. If the company does not show the desire to expand its business, the released funds can be used to purchase CASCO insurance policies, which is a guarantee to preserve the park even from the influence of force majeure circumstances or to finance projects of another nature [22];

- create additional reserves to eliminate the possible force majeure effects, which is especially relevant for enterprises involved in international trade. In particular, it may concern the loss of cargo during transportation. The international rules to interpret terms most commonly used in international trade, Incoterms require companies to be responsible for conserving cargo (and other issues). For example, the producer is responsible for the quality and integrity of the delivery of vehicles produced in the Republic of Korea on the way from the factory to the port in Greece or in Ukraine, and at the port the national representative becomes responsible;

- introduce additional mechanisms for staff motivation: introduction and expansion of social packages, deepening of the bonus system, which will not only improve the corporate climate and motivate the staff but will also enable the company to get the best personnel, which will also have a positive effect on its development;

- the enterprise becomes more effective in terms of raw materials and materials used in the production or in the service provision (if the enterprise is in the non-producing sector). Financing of projects related to the energy-efficient equipment implementation enables to obtain a positive economic effect by reducing the average daily consumption of electricity, natural gas and other energy resources [16]. A separate aspect of this problem is the use of water, raw materials and materials. Enterprises that implement a closed cycle of water use, reduce production waste capacity, also have the ability to save and to release financial resources. In addition, businesses can actively use the concept of "green office", a smart office, which is also positive for the company's financial sustainability;

- the enterprise becomes more attractive to foreign partners as it has a reputation of being "ecologically-friendly" - a company with a high level of corporate social responsibility, and therefore can expand the geography of its markets even to developed countries, where the role of this component is often decisive. Besides, such a company can become a part of the green supply chain, the role of which in the global processes regarding the distribution of goods and services is increasing every year [1]. An example of how the company makes a profit and incurs significant losses due to environmental responsibility is the so-called Dieselgate - a scandal with reductions of diesel engines emissions indicators produced by Volkswagen AG Group. This situation caused not only the recall campaign of cars, their storage at special places (with all the relevant financial costs) but also caused the disruption of the automotive industry on the European continent [6]. The result of such a disturbance is the gradual restriction and potential ejection to use diesel engines in the future, and the loss of funds previously invested in R&D.

- increasing the investment attractiveness of a company, investing in energy-saving and resource-

saving technologies. A positive image in the environmental responsibility area does not only have an economic impact on the sales level but also creates conditions, in which the company is not engaged in the search for an investor, and the investor is willing to take the financial part in such an enterprise, but those are completely different conditions for financial and economic efficiency for the enterprises. Certainly, such a strategy of enterprise development may have a downside, which, in our opinion, is revealed in the following effects:

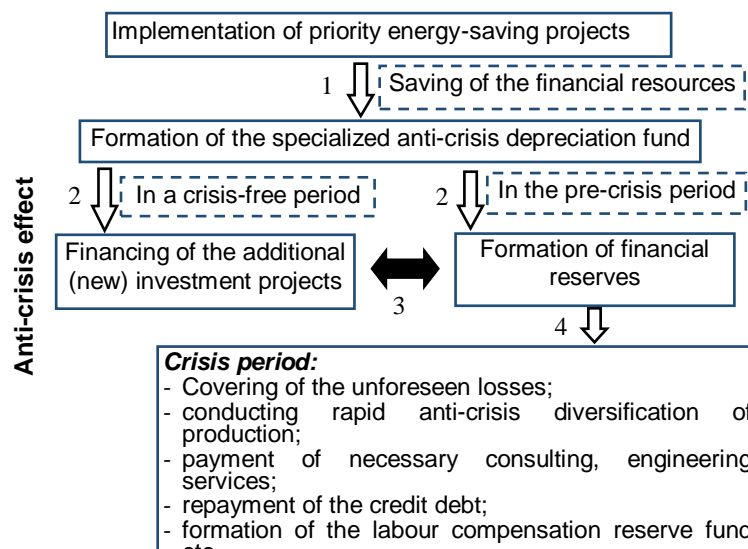
- first (financial-economic and property effects), there is a need to accumulate a certain financial resources fund for the implementation of the first energy conservation projects. There may be a problem that such accumulation will require either obtaining a bank loan or finding an outside investor, which can have strategic consequences for the enterprise's activities on debt repayment, property issues, etc .;
- second (social effect), the introduction of energy-efficient and resource-saving technologies often leads to staff reductions, which has a positive financial impact due to wage savings and various corporate social assistance, but also has a different image effect [2, 9, 12]. The reduction of staff always creates a negative reputation of the company in the labour market (among skilled workers);
- third (fashion effect), energy and resource conservation projects must not only be funded, implemented but also maintained, which often requires additional financial injections. Ukrainian enterprises often implement various energy-saving projects without worrying about the cost of their maintenance. Later, making sure that even the latest technologies without the cost for their maintenance, cannot provide the claimed economic effect, the investment begins to be declared, but not to be used in any way in the enterprise's main activity. Accordingly, energy and resource conservation must be conscious - the result of an objective desire and a real possibility of its realization. Otherwise, if it is just a tribute to corporate fashion, it is nowhere to be funded;
- fourth (the effect of corporate fanaticism), it is the situation when, on the wave of the success to implement energy and resource conservation projects, the company begins to fund everything that is possible, not because it is objectively justified, but since it is on-trend of previous periods. Such a policy can create conditions in which the burden on the budget of the enterprise can become catastrophic, and therefore the main purpose of the enterprise's activity will not be a profit, but its obtaining to finance and to expand energy-saving. Thus, investment projects should be implemented only in those areas where there is an objective need for them and the highest economic return;
- Fifth (payback effect), there is also a problem when enterprises involve bank loans to finance their first energy conservation investment projects. Therefore, in addition to the actual costs of the project, the company has to pay some interest. Accordingly, the payback period, that is the period in which the effect of energy savings can be felt can be quite long.

Therefore, the development of programs for technical reequipment on sustainable development principles, along with the unconditional advantages, also has a number of difficulties. Therefore achieving maximum efficiency from their development and implementation depends largely on the objective need for such implementation, real financial capabilities, readiness to finance implemented projects maintenance, as well as the level of technical knowledge and motivation of the administrative staff.

The above topics were related to the components of "international business" and "energy-saving". A further task is to formalize their impact on the third component of the enterprise's financial sustainability.

There are many scientific approaches to understanding the essence of the financial stability concept. For the purposes of our study, we consider financial stability as the state of the enterprise's accounts, which would provide constant solvency [2]. It means building an approach to enterprise management that would provide the formation of additional reserves besides maintaining standard requirements (to fixed assets, to the ratio of receivables and payables) that would allow companies to finance additional investment projects and form financial reserves.

In our opinion, each of these areas should be realized by releasing and saving funds from the priority energy-saving projects implementation, while technically, such bleached should be accumulated in the form of a special fund: specialized anti-crisis depreciation fund or buffer (Figure 1).



**Figure 1** – Basic scheme of the specialized anti-crisis depreciation fund formation (author's investigation)

There are some explanations for Figure 1:

- step 1 - release (saving) of financial resources through the implementation of the "international business" components and the first projects of the "energy-saving" component. Energy savings at this stage can be realized through the use of bank lending and the search for external investors;
- step 2 – there is an opportunity to accumulate financial resources, taking advantage of the effect they provide, by saving financial resources (when the payback period of the implemented technologies has passed). At this stage it is possible to form a specialized anti-crisis depreciation fund (buffer);
- step 3 – the use of resources accumulated in the buffer for the implementation of further energy conservation projects or/and the reserve funds formation;
- step 4 - during the crisis period, having formed financial reserves, the company gets the opportunity



to use the free funds to maintain financial stability and gain the potential for further development. In our opinion, this is a way the anti-crisis effect of the enterprise's financial stability management mechanism, which performs foreign economic activity under the mechanism "financial stability - international business – energy-saving", is shown.

This approach may give the impression that any management should be anti-crisis. In this case, there are two main approaches in the literature to understanding the anti-crisis management essence (except classical regulatory and preventive ones): permanent and temporary and, accordingly, two main trends in management: the first states that anti-crisis management should occur constantly, in maximum number of directions, should be constantly financed, etc. The second confirms that crisis management should take place only when the enterprise, analyzing the main financial and economic indicators, experiences a certain decline or in a situation where the exogenous environment for the enterprise may be characterized by instability. Each of these directions has both advantages and disadvantages.

The enterprise management mechanism suggested is regarded as a certain "golden mean" because the provision of financial resources from the savings obtained through the implementation of energy efficiency projects enables to enhance the financial culture – the company heads for cost rationalization due to the necessity to create such reserves, and create a more adaptive system of anti-crisis management, which, on the one hand, is carried out constantly (possibly systematically), and, on the other hand, does not overload the enterprise with additional costs. In addition, it has a positive impact on the image of the company, as it helps to establish a corporate social responsibility system. Moreover, it will help develop the company's international relations, given that the fact that company has the opportunity to expand the geography of its activity, and therefore, open access to new technologies, new knowledge, new experience.

#### **4. DISCUSSION AND CONCLUSION**

The rational use of financial resources is a rather acute problem for every enterprise. Not only small businesses but also large multinational corporations are tasked with finding ways to release working capital. In these circumstances, and given the extreme demand for temporarily available financial resources, the investment projects are implemented by enterprises, forcing them often to make significant concessions to investors and choose not always the most effective conditions.

Within such studies, special attention is paid to investment projects in energy and resource-saving technologies. Today, energy-saving technologies are no longer just a tribute to fashion, but also have a tangible financial impact.

However, such projects are not implemented without disadvantages, including the additional financial burden on the enterprise to accumulate funds for their implementation, the cost of maintaining investment objects and more.

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## ADDITIONAL INFORMATION

### Funding

The publication contains the results of research carried out within the framework of research works of the Ministry of Education and Science of Ukraine "Innovation management of energy efficient and resource saving technologies in Ukraine" (№ 0118U003571), "Innovative drivers of national economic security: structural modeling and forecasting" (№ 0117U003922), "Formation of the environmentally safe long-acting fertilizers based on the phosphate raw material" (№ 15.01.09-20/22 GP-01)

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