TRANSACTION COSTS OF BEST AVAILABLE TECHNOLOGIES IMPLEMENTATION

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Abstract

The paper presents the results of research connected with the distribution of effects of economic activity in favourable environmental conditions and further defines the notion of "ecological rent". The paper also explores the identification of transaction costs of implementing Best Available Technologies (BAT).

According to the authors, the implementation of BAT in the form of commercial environmental, energy and resource saving projects reduces additional and alternative transaction costs.

Additional costs are the ones that accompany the process of buying different kind of licenses, permits as well as the costs associated with a potential corruption component and lost profits resulting from the situation when a company is ready to operate but cannot start off because of bureaucratic delays.

Alternative costs are those of time resources needed for getting emission and waste disposal permits as wells as the cost of some environmental management procedures.

The paper also explores the methods of including BAT in the assessment of companies' economic efficiency and the influence of BAT on a company's investment policy.

Key words: assimilative potential, best available technologies, ecological rent, transaction costs, joined implementation projects.

JEL Code: D20, D23

Introduction

The modern concept of sustainable development and prospects of environmentally sustainable growth of an economy add new demands to distribution criteria, the key one being economic efficiency. The quality of limitedness, which is the criterion of economic resources inclusion

in market turnover, is now applied not only to natural capital (mineral resources, air, water, flora, fauna etc.), but also to the processes of its development and reproduction, i.e. assimilation potential. Widening the subject of research in terms of the assimilation potential results in a more objective assessment of the economic efficiency of a system. One of important requirements of such assessment is to estimate the effects of economic activity in favorable environmental conditions. Many authors consider the importance of natural capital preservation for the sustainable development (Alexander, List, Margolis et al., 1998; Ekins, Simon, Deutsch et al., 2003; Turner, Daily, 2008).

The question of the limitedness of natural capital, peculiarities of its utilization and reproduction are in their turn connected with the problem of generation and distribution of ecological rent. Ecological rent is a specific additional income that is created due to the minimization of public expenses on meeting eco-economic demands.

According to O.Veklich (Veklich, 2006), ecological rent is an outcome of specific economic relations between the owner of ecological resources and a business entity connected with the purchase, ownership, utilization and income from the use of ecological resources.

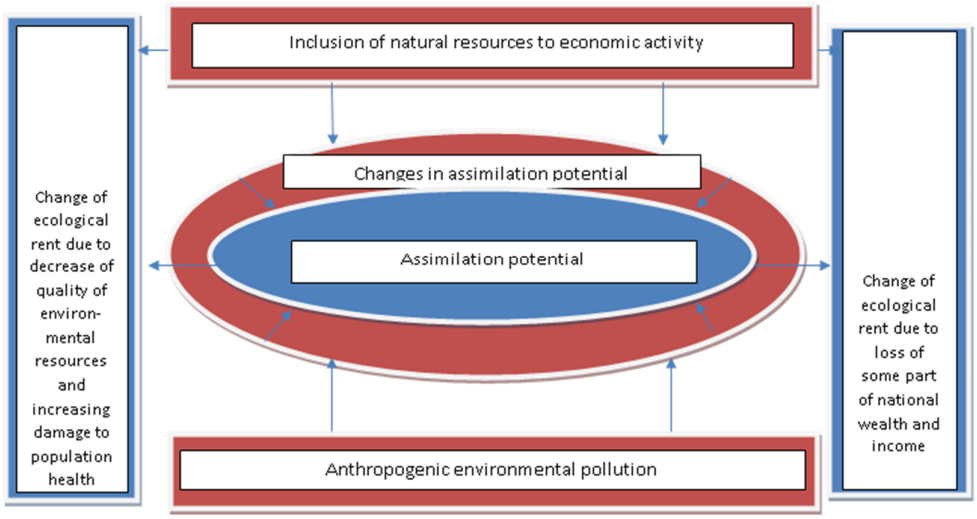
T.Bratenkova (Bratenkova, 2010) defines ecological rent as "a form of income appropriation arising from the use of high quality natural environment which is created by its unique natural sites and the use of limited natural resources that are capable of regenerating their qualities (including the environment creation function)".

Both authors, therefore, set a link between "ecological rent" and an additional income from receiving an eco-economic effect from the consumption of a variety of ecological resources, conditions and features. This allows the authors of this paper to consider environmental assimilation potential as an economic category and apply the economic approach and performance criteria (“costs-benefits”) to its assessment and analysis. If understood this way, changes in environmental assimilation potential (fig.1) due to considerable involvement of natural resources in economic activity and intensive anthropogenic environmental pollution decrease ecological rent as they cause degradation of natural resources potential. Viewing ecological rent from this angle, the authors define it as "additional income (profit) from exploitation of territory which has the best assimilation capacity potential".

1 Transaction Ecological Costs

The possibility to apply the income approach to the assessment of environmental assimilation capacity and the suggested definition of ecological rent are important for establishing the presence of costs of preserving and maintaining the initial assimilation potential and for evaluating socially defined limits for these costs. The authors interpret these expenses

Fig. 1: Assimilation potential's influence on ecological rent



Source: Belik, I.S. (2011).

as Transaction Ecological Costs (TEC) connected with the preservation of the "best characteristics" of assimilation capacity.

The above mentioned points allow us to consider as TEC other expenses connected with the use of innovative technologies in geological exploration, forestry, water industry, agriculture, the processing and use of resource-consuming and environmentally-intensive products, construction of treatment facilities, power plants, vehicles, raw materials processing and so forth, including the cost of implementing best available technologies. The application of new technologies (best available technologies) minimizes human impact on the environment, so the cost of their support is considered as a part of TEC.

2 Classification of Transaction Costs

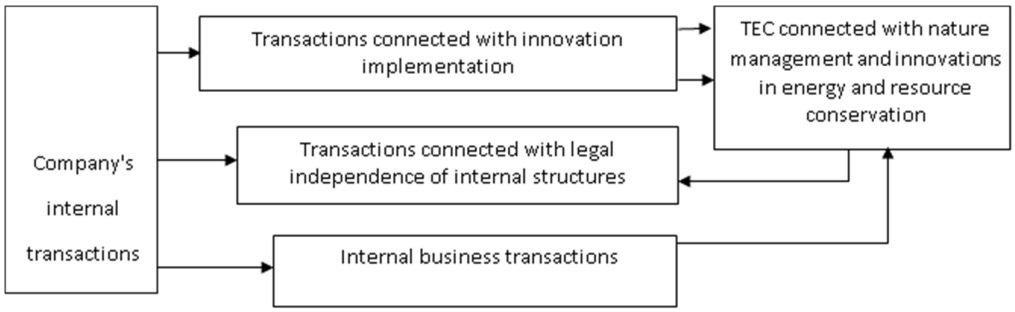
In the contest of globalization, companies' transaction costs (that occurred as external in relation to other market players) began to originate inside companies themselves. Economic theory differentiates between several types of transactions depending on the hierarchy level

activity (Chang, SJ., Hong, J., 2000; Rindfleisch, A., Heide, J.B., 1997): global, national, intercorporate, internal.

Recent research on the influence of Transaction Costs (TC) on the effectiveness of a company's operations and its investment generated an increased interest in internal transactions and, in particular, in costs connected with innovation implementation in environmental management, energy and resource conservation (fig.2).

In their analysis of internal transactions connected with the implementation of best available technologies (i.e., of those causing no environmental pollution, fig.3), the authors admit that at every stage of planning, implementation and operation, which all entail appropriate expenses, there will also be TCs generated by similar groups of costs, but of ecological nature.

Fig. 2: Structure of internal transactions



Source: Belik I.S., Karelov S.V.; et al. (2013).

The authors believe that the implementation of BAT as commercially-driven energy and resource conservation projects brings about additional and alternative transaction costs.

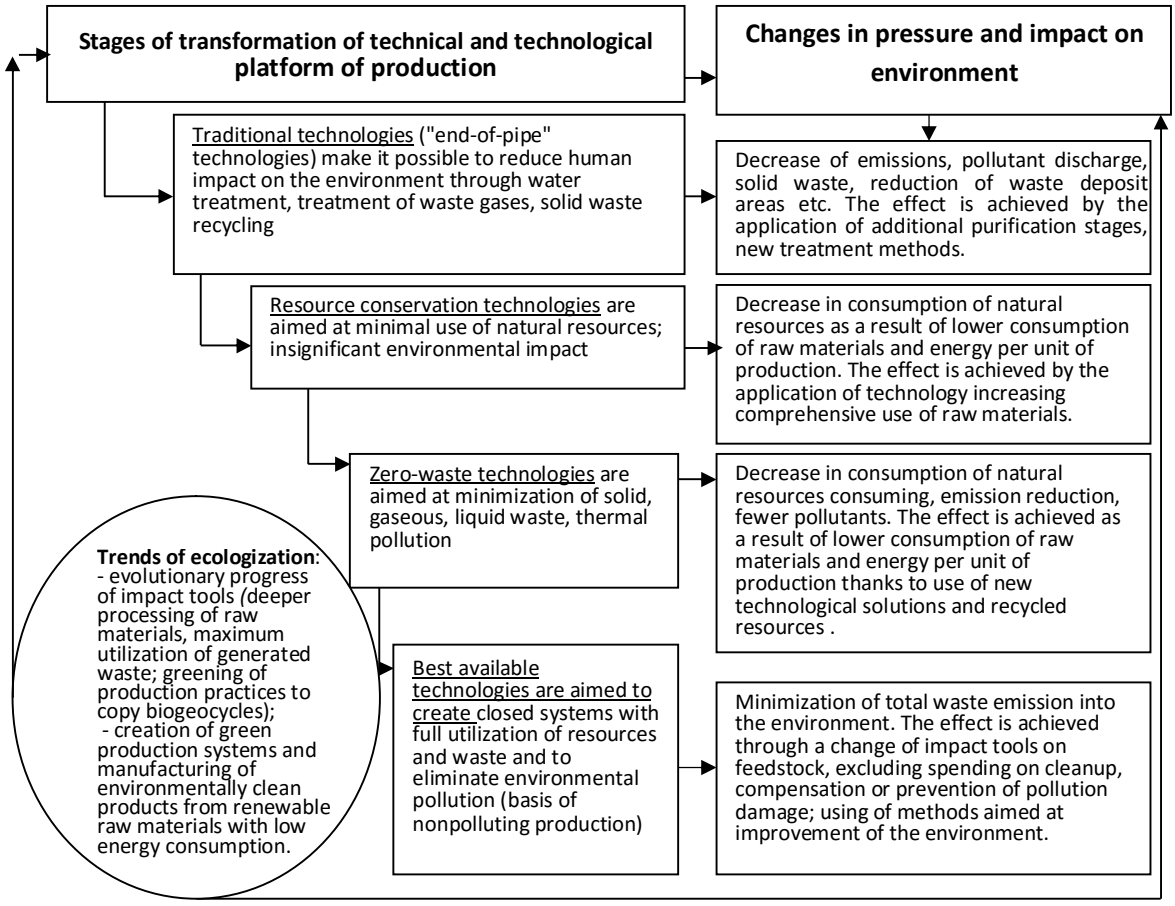
Additional costs are those related to the procurement of various licenses, permits and potential corruption expenses. They might include lost profits that occur when a company is ready to carry out some licensable activity, but is unable to do so because of a pending license application.

As additional costs we can also consider those arising from the absence of one's own design capability (time spent on searching for and negotiating with a design contractor, costs of qualitative examination and development of terms and conditions of tender), costs of hunting for and hiring qualified personnel for BAT implementation or searching for a company who could train (retrain) the existing staff.

The authors classify as alternative the costs of absence (time spent on of streamlining the procedure of seeking approval for temporary emission limits, waste disposal, which is eliminated after BAT implementation) and reduction of environmental management procedures, "ecology reports" in companies implementing BAT etc.

Exploring the first group of TCs associated with implementation of ecological innovations, the authors identify them through correlation with current expenses dynamics. When the structure and composition of TCs were identified for the purpose of dynamics studying, they were grouped in line with the ecological costs classification (table 1).

Fig. 3: **Improvement of technical and technological basis of production in process of its ecologization**



Source: Belik I.S., Karelov S.V.; et al. (2013).

In corporate structures, the following processes are accompanied with ecological costs: tax payments, payments for environmental pollution and severance tax, creation (construction and purchase) and maintenance of conservation capital assets, waste recycling, sale of waste as recyclable raw materials, environmental insurance, environmental audit etc. The TC classification was therefore made according to these processes (table 1).

Tab. 1: Classification of transaction costs

Process	Transaction costs	Description
1. Tax payments, pollution charges and severance tax	Free-rider expenses	When a company makes all environmental payments in good faith and finds itself at a competitive disadvantage compared to those who evade payments. This situation occurs also internationally, which incur expenses to unify state ecological control and ecological rules
	Metrology expenses	Cost of measuring volume of waste and water dumping, other types of environmental pollution which are subject to levy
2. Construction, maintenance of capital assets for conservation purposes	Information and negotiation costs associated with the construction of nature conservation facilities	Time spent on conservation facilities: - search for contractor - obtaining various permits, licenses for creation and overhaul of existing production. Corruption burden ("kickbacks")
3. Implementation of traditional technologies harmful to environment	Expenses to keep up consensus ideology in a society	Additional costs to create positive relation in society to the implemented ecologically dangerous technology
4. Waste recycling, sale of waste as recyclable materials	Information expenses	Cost of searching for waste storage sites. In case of waste sale – searching for a buyer
	Negotiation expenses	Time spent on taking out government approval for a waste storage site, monitoring of potential waste buyers, tender procedures
	Opportunistic behavior expenses	Growing risks because of irresponsible behavior of staff connected with waste disposal process. This causes additional expenses on unforeseen environmental consequences
5. Environmental insurance and audit	Information search, negotiation, metrology expenses	Governmental approval of methods to define insurance risks and payments. Integration of databases of voluntary insurance

Source: Belik I.S., Karelov S.V.; et al. (2013).

3 Transaction costs of best available technologies implementation

TCs which arise due to BAT implementation are rarely identified and are usually disregarded in the management process (table 2). Identification of these TCs makes it possible to determine their behavior and use it as a basis for a classification in order to evaluate their influence on product cost.

Tab. 2: TCs in the process of production ecologization

Transaction Costs	Technological platform			
	"End-of-pipe" technologies	Resource conservation technologies	Zero-waste technologies	BAT
Free-rider expenses	+	+	+	-
Information and negotiations expenses	+	+	+	-
Expenses to maintain consensus in society	+	-	-	-
Information expenses while constructing conservation facilities	+	+	+	+
Negotiations expenses while constructing conservation facilities	+	+	+	+
Opportunistic behavior expenses	+	+	+	-
Metrology expenses	+	+	-	-

Source: Belik I.S., Karelov S.V.; et al. (2013).

As shown by the analysis of TCs that are associated with different production arrangements, the TCs of BAT implementation do not have a substantial share in overall costs. However, the TCs of BAT implementation have a significant influence on the assets value of a company and its financial performance.

At present, the environmental side of production is becoming increasingly important, i.e., it becomes of interest not only to controlling bodies and the company itself, but also for society and final consumers because of a growing connection between quality of life and the environment. During the past 10 years more and more manufacturers have been highlighting the environmental friendless of their products and paying attention to protecting the recreational functions of the environment. This is reflected in business performance measures. For example, when performing an eco-economic appraisal of BAT implementation efficiency, the authors suggest accounting for "benefits from intangible assets growth" as income when

they result from the recognition of the "eco-production" certification label as intangible asset, and TCs – as expenses (Vyvarets, A.D., Distergeft, L.V. (2002)).

Conclusion

As the national economy has entered the world market where the environmental factor is an essential element of competition, external (environmental regulation including carbon dioxide emission quotas) and internal (social responsibility, other problems in business) pressure on the companies polluting the environment intensifies. The influence of environmental regulator on the competitiveness of businesses can be observed in many sectors: production of cars, electronics and home appliances, other fast moving consumer goods, transportation and tourism. Consequently, the problem of evaluating ecological costs, including expenses on substitution of utilized natural capital and "prevention fees" such as BAT implementation, is extremely relevant.

In current conditions, a possible alternative to anthropogenic influence on the environment is an efficient industrial policy that conforms to the manufacturing ecologization process and business processes that are evaluated in terms of environmental criteria of economic management. This can be ensured with the development of an investment program based on ecological and economic criteria and guided by the Kyoto Protocol.

Mechanisms offered by the Kyoto Protocol can be adopted for addressing the problem of investment mobilization for the financing of projects of BAT implementation in environmentally intensive industries. At the same time transaction costs will be reduced (both additional and alternative ones, according to the authors' classification). The essence of such projects is that one country implements a project for reducing greenhouse gas emissions through BAT implementation, while another country invests money in this project and takes over gained benefits in return. These types of investment are advantageous primarily to government-owned funds of countries with commitments to decrease emissions; to banks who sell Emission Reduction Units (ERU); to companies who are ready to invest in emission decrease to compensate for their own emissions in an easier and cheaper way.

Projects of BAT implementation are connected with greenhouse gas emission reduction and usually have to meet particular requirements for joint implementation projects (JI projects). One of them is that such projects should result in an emission decrease or an increase in carbon dioxide absorption compared to any other scenario.

It is possible to build a mechanism of investment attraction for projects of BAT implementation similar to JI projects in the Kyoto protocol. However, for doing that, an equivalent of pollutant emissions (like carbon dioxide equivalent) should be developed. It will contribute to the integration of BAT implementation mechanisms in JI mechanisms and will encourage companies' investment activity.

International control of selection and implementation of BAT and JI projects should be carried out by a special authority, e.g. an oversight committee. In view of Russia striving to implement a western system of technological standardization based on BAT and its rather vantage position in terms of emissions under the Kyoto protocol (connected with usage of own national procedures of projects selection and estimation of emission reduction), one can suggest an investments attraction mechanism similar to JI projects with the subsequent transfer of ERU to the investor party. As a result, the donor company will meet environmental requirements and will have more advanced production engineering solutions in the future and will save on investing in BAT implementation. The other side will get ERUs at an acceptable price and reduce transaction costs in return.

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