# Economic incentives for industries in the Russian Federation

Reforming environmental standards

**Elena Kholodova**

Supervisor

Zoltan Illes

Thesis for the fulfilment of the
Master of Science in Environmental Sciences, Policy & Management
Budapest, Hungary, June 2009

MESPOM Programme:

Lund University – University of Manchester - University of the Aegean – Central European University

Erasmus Mundus Masters Course in Environmental Sciences, Policy and Management

# MESPOM

*This thesis is submitted in fulfillment of the Master of Science degree awarded as a result of successful completion of the Erasmus Mundus Masters course in Environmental Sciences, Policy and Management (MESPOM) jointly operated by the University of the Aegean (Greece), Central European University (Hungary), Lund University (Sweden) and the University of Manchester (United Kingdom).*

Supported by the European Commission's Erasmus Mundus Programme

Education and Culture

Erasmus Mundus

# Acknowledgements

One page is not enough to express my feelings and gratitude to everybody who helped me finish this course and write the thesis research.The final research is definitely the main and the last stage of the course. But there would not be this stage without previous two years. The experience that MESPOM program gave me is unforgettable. With all its hardship during the application process, disappointments after the first exams and challenging surviving in different countries it is worthy to go through it again.

First of all, I would like to express my sincere gratitude to the Dean of the Department of Environmental Sciences and Policy, Ruben Mnatsakanian, for his humaneness and understanding. Thank you, Ruben Artemovich.

Special thanks to the coordinator of the MESPOM programm Aleh Cherp who gave me chance to study on MESPOM and who has wonderful feature remember everybody. This gives us feeling that inspite of we are not students anymore we are still part of the team.

I would like to thank Irina Herczeg and Krisztina Szabados for their help and kindness. Every day during these two years I knew that there are always people who can listen and hear, who were always near for response and advice. Ladies, you made my life at CEU easier.

My special gratitude goes to Håkan Rodhe, Director of Educational Programmes in IIIEE, nonordinary pedagogue and good psychologist, as well as Andrius Plepys who believed in my talents and taught me how to count through the mysterious science of LCA. Special thanks to Lars Hansson whom we love just because he loves us as we are.

I would like to thank Zoltan Illes who is the best supervisor ever. His mentorship was of the very right kind: he trusted my opinion, believed in my time-management skills and showed me example of real politician.

The official data used and expert opinions of my collegues from the Ministry of Economic Development and Trade of Russia gave significant contribution to my research. I am grateful to Mikhail Zhukov for his reliable help and advice as well as my ex-bosses, Oleg Pluzhnikov and Vsevolod Gavrilov, who inspired me on this topic.

I would like to thank my mom as she loves me even without this diploma for all her superhuman efforts put in my education and given knowledge of fight and hope. As well, I would like to thank my fiancé who not only took all responsibilities for housekeeping while I was writing the research but also was brave enough to make me proposal somewhere in between the first and second chapter.

# Abstract

After the Soviet Union collapse Russian Federation met the challenge to transform Soviet legislation in all fields. Historically laws and regulations in the field of environmental protection were mostly oriented on efficient, from the point of view of its benefit, nature use. Nowadays the significance of cumulative ecological effect and importance of preventative environmental strategy are widely recognized and considered by the Russian government as issues of great concern.

Industrial pollution in Russian Federation is the most significant menace for human health and is on the top of the list of the most threatening environmental dangers. Taking into account rapid economic development of the country economic incentives are efficient instruments that facilitate the realization of environmental regulations and motivate private business sector to implement activities aiming to reduce ecological impacts caused by their activities. Comprehensive and efficient system of environmental protection based on the collaboration between private business sector and governmental bodies is one of the prerequisites for the developing country such as Russia to become an equal player on the international market. Among the issues that require attention in terms of achieving visible result in the field of business-government environmental cooperation the demand side, i.e. strict policy measurers and regulative instruments aiming to make realization of environmental activities by industries desirable, is probably the one that have to be addressed in the first turn, and the main goal of such measures is to influence the case before it takes place.

System of economic incentives for industries which is used worldwide (e.g. voluntary agreements, grants, technical assistance, various informative instruments, governmental investments and subsidies) and made a good showing during the last decades is poorly developed in the Russian Federation. Restrictive economic measures prevail in the current Russian legislation. The research reveals that existing economic instruments are characterized as particularly fiscal and not efficient. Environmental payment, the only working economic instrument in Russia, is meaningless from the economical as well as ecological point of view. It is not transparent, facilitates corruption, does not stimulate industries to implement environmental activities and does not correspond with acting Russian environmental legislation. The prevalent practice of reduction of environmental payments for industries has a lot of shortcomings such as individualization of decision making by responsible authorities, exhaustive list of the environmental activities to be implemented by nature user and uncontrolled indices of factual impacts.

It is of principal importance to arrange a dialog between the government and business. Economic development and improvement of the investment climate are primarily hindered by big administrative barriers. In turn, the latter are determined by imperfect normative support of "government-to-business" relations, low information openness of authorities, critically low level of computerization of state services oriented to clients. All the factors listed above leads to the increase of costs of businesses for overcoming administrative barriers (including the increase of corruption), growing risks for commercial projects, reduction of investment attractiveness and value of business.

# Executive Summary

Currently industrial pollution in the Russian Federation is the most significant menace for human health and it is on the top of the list of the most threatening environmental dangers. At the same time alleviation of environmental legislation in particular ecological standards created comfortable conditions for obsolete machinery use to the prejudice of re-equipment of industries. As a result of obsolete equipment use these processes entailed considerable negative impact and cumulation of pollution in all components of the environment. In addition to environmental pollution the situation is aggravated by uncertainties in state environmental administration. Market economy and recent economic crises in Russia resulted in misbalance in management processes and control in the area of environmental protection; they also contributed to the opposition of economic and environmental interests. And unfortunately economic interests prevail when solving economic issues.

The system of economic incentives for industries which is widely used in European Union countries and made a good showing during the last decades is poorly developed in Russian Federation. The existing system of environmental payment in the Russian Federation, the only working economic instrument, is meaningless from the economical as well as ecological point of view. It is not transparent, facilitates corruption, does not stimulate industries to implement environmental activities and does not correspond with acting Russian environmental legislation. The prevalent practice of reduction of environmental payments for industries has a lot of shortcomings such as individualization of decision making by responsible authorities, exhaustive list of the environmental activities to be implemented by nature user and uncontrolled indices of factual impacts.

The purpose of the research was to discover possible strategy for the elaboration and implementation of the effective environmental legislation which will provide comfortable conditions for all sides involved in industrial processes. On the basis of analysis of Laws, Governmental decrees, scientific researches, governmental reports in the field of economic instruments facilitating environmental protection as well as literature on foreign experience in related field the gaps and shortcomings of the system of economic incentives which currently acting in Russia were identified. Thus, the research questions of this master thesis are the following:

- What is the definition/notion of economic incentives in developed states?
- What are the successful examples and achievements in the identified area realized by developed countries that could be used?
- What are the possibilities for improvement of the current system of economic instruments in Russia?

The methodology of the paper was planned and structured in accordance with availability of information, academic or practical, which will lead to answers. The main part of the research can be identified as qualitative i.e. provides the keys “to understand the meaning of social events for those who are involved in them” (Esterberg 2002).

The review of literature mentioned above gave an overview about the general approach to economic incentives used in the Russian Federation from the point of view of drafting fundamental legislation in the related field and from the side of experience of business representatives in the implementation of the regulations. Empirical data was collected from the official states and environmental experts from industrial companies. The contribution of the paper consists of an investigation of the most significant barriers for the implementation of efficient economic incentives in a field of environmental protection with the view of the current state of Russian environmental legislation. Ex ante evaluation of possible solutions based on reforming of the system of environmental standards in terms of application of the best available techonologies was made.

Some deficiencies of the existing norming system were identified. First of all, norms are calculated within the limits if admissible impact, i.e. the payment is taken from conventionally law-abiding economic agents. Besides, the amount of fees is identified on the grounds of the territorial principle (increasing coefficients). Second, companies pay different sums of money for the same violations regardless of their hazard for the environment and depending on their location. As a result the existing norming system does not fulfill the function of motivating to create clean production and introduction of up-to-date technologies of waste and air emission treatment due to extremely low payments. Enhancement of the norming system in the area of environmental protection should follow the key goal of creating a system of state regulation of the impact of economic activities on the environment, which guarantees consistent reduction of negative impact per production unit, preservation of favorable habitat and securing environmental safety.

In Russian situation reforming can be based on the system of environmental payments, which can be transformed in a way when Incentive Based methods are supported by comprehensive system of command-and-control regulations. . Environmental payments will be effective, if the rates are rather high. Then the mechanism of the payment will become an economic incentive for changing the structure of production in order to reduce pollution. Besides, it is necessary to create conditions for partly financing of environmental investments of industries from other financial sources, for instance, environmental funds. The only one way out of the situation can be to build a new system of norming and economic regulation. It is possible to present the key parameters of the norming system aimed at the best available technologies. Besides necessary administrative regulation, implementation of the BAT approach should be supported by stimulating economic tools. Those can be payments, subsidies or permits. For introducing BAT some changes will be required in Russian environmental law. The following elements are critical for applying BAT in Russia:

- Law on the best available technologies
- Transition to technological norming
- Techniques for issuing comprehensive permits.
- Changes to the Fiscal Code of the Russian Federation
- Identification of the branches of industry.
- Independent consulting body
- Qualified specialists

It is indispensable to change the attitude to regulating nature conservation. The environment should be positioned not as a separate and isolated area of activities, but as an integral part of all activities: economy, city development, production, research, education etc. Administrative and economic

methods of nature conservation activities management should be combined for securing effective environmental security. This should be reflected in introducing environmental incentives in the process of decision making at both the highest level and in private business. The best way out of the existing situation is gradual switch to technological norming of the environmental impact on the basis of the best available technologies and methods that can ensure the reduction of the negative environmental impact as well as the increase of energy and resource effectiveness. It is obvious that such changes will require significant corrections to the current environmental legislation. It is suggested that draft laws are produced that envisage the following:

- enhancement of environmental protection system, including environmental payments that motivate enterprises to modernize their key assets and use resource and energy saving technologies;

- transition from the practice of issuing temporary individual permits for excessive emissions and discharges to the system of technological norms for admissible environmental impact with the account for using the best available technologies;

- cancellation of overlapping permits in the area of protecting water resources (that include norms for admissible emissions, permits for emitting harmful substances, and decision on providing a water body for use).

# Table of content

# List of figures

# List of tables

# 1. Introduction

The Russian Federation owns enormous and diverse potential of natural resources. Currently Russia holds about 45% of the world's reserves of natural gas, 23% of coal, 13% of oil. The territory of the country covered with forests makes 22% of the world's forest surface. This well-being of natural resources allows develop successfully all sectors of economy: energy sector, ferrous and non-ferrous metallurgy, chemical industry, timber industry, construction industry etc. (Council of Federation of Russia, 2008) During the last decades processes of intensive industrialization and extensive extraction of natural resources were taking place in the Russian Federation. Today's economic growth of Russia to a large extent is determined by the extracting industries and is secured by high international prices for oil. Such a trend causes logical worries concerning the impact of that growth on the environmental quality both in the country and globally (WWF, 2007).

Under the modern conditions natural resources are perceived as a product, which is on a counter and it is to be sold and income is to be gained. At the same time, the income grows together with the growth of the price for that product. Another way of increasing the income from natural resources is to increase the volume of sales given relatively low prices. And the third way is to augment the income by increasing sales volumes and prices for natural resources (Kaveshnikov, 2006). However, such an approach is erroneous both from the point of view of the opportunity to assimilate by the natural environment and compensation of costs for reproduction of the natural resource.

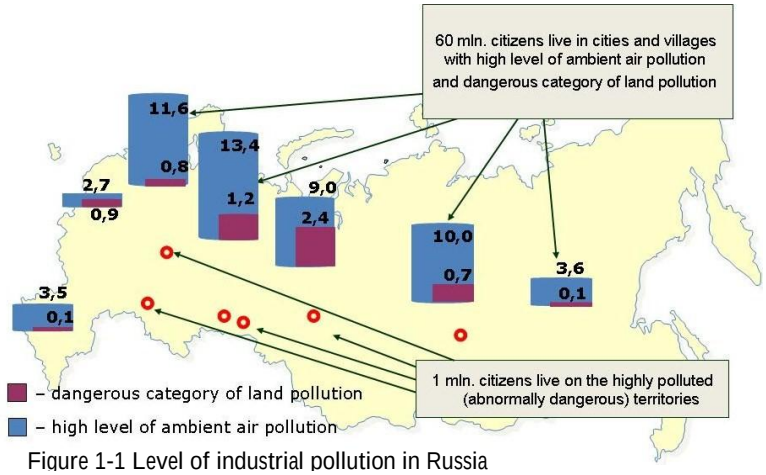


Figure 1-1 Level of industrial pollution in Russia

Currently industrial pollution in the Russian Federation is the most significant menace for human health and it is on the top of the list of the most threatening environmental dangers. Industrial sector can be characterized with high extent of equipment deterioration and technological backwardness (pers.comm.Pluzhnikov). Industries pay a significant role in the process of aggravating the environment and worsening people's health; in particular it is chemical industry, which is on the second place among the industries in terms of discharging polluted wastewater only (Council of Federation, 2006).

In Russia transformation of economy from communist to market was followed with a scale privatization and cutting down of industrial production. During 90s significant number of ownerless and economically unprofitable objects characterized with high environmental danger appeared in the country as well as territories in crisis ecological conditions (Fig. 1).

The privatization of the Russian industrial complex was implemented without an assessment of responsibility for cumulative environmental damage (FSTEAC 2007). At the same time alleviation of environmental legislation in particular ecological standards created comfortable conditions for obsolete machinery use to the prejudice of re-equipment of industries (Council of Federation, 2008). As a result of obsolete equipment use

these processes entailed considerable negative impact and cumulation of pollution in all components of the environment (FSTEAC 2008).

In addition to environmental pollution the situation is aggravated by uncertainties in state environmental administration. Market economy and recent economic crises in Russia resulted in misbalance in management processes and control in the area of environmental protection; they also contributed to the opposition of economic and environmental interests. And unfortunately economic interests prevail when solving economic issues (Council of Federation, 2006). At last years the system of Federal executive power in a field of environmental management and protection was permanently reorganized. The decisions about the development of the system of governmental bodies were mostly taken without any scientific argumentation. More of that, the conversion did not aim consistent and effective provision of ecological security and liquidation of ecological damage but was often based on individual interests of single ministries leaded by political and economical considerations. As a result those governmental agencies lost their authority. Eventually it brought to the loss of cadre, environmental payment evasion of private enterprises, increase of number of ecological infringing activities, decrease of public attention to environmental problems. (pers.comm.Soldatkin)

Economical situation in Russia is gradually changed. On this stage it necessary to find solutions that would lead Russian economy to sustainability. This goal is announced in all messages, speeches and programs presented by national government (pers. comm. Zhukov). At the same time sustainable development is impossible without taking into account ecological factor and efficient collaboration of government, business and society in a field of environmental protection. It is obvious that conservation of the current environmental management will be a barrier for further economic and social development of the country. More of that it will discredit the Russian government. Nowadays, the significance of cumulative ecological effect and importance of preventive environmental strategy are widely recognized and considered by the Russian Government to be the issues of great concern. As it was noted by the Russian Prime-Minister Vladimir Putin, under conditions of rapid economic growth industrial sector, transport and infrastructural complex permanently increase the burden on eco-systems. Sustainable development of the Russian Federation, high quality of living and health of its citizens as well as national security can be provided only in case of reservation of natural resources and quality of environment (Council of Federation of Russia, 2008). This can be reached through creation of legal, organizational, economic and technological mechanisms, complex of measures that will lead to liquidation of cumulative ecological damage and sustainable relationship among all stakeholders in a field of environmental protection.

After the Soviet Union collapsed, the Russian Federation met the challenge of transforming the Soviet legislation in all fields. Historically laws and regulations in the field of environmental protection were mostly oriented to efficient nature use from the point of view of benefits. The very famous expression that has been widely used during the communist regime in a field of nature use was: “We can not wait for favors from nature. Our aim is to take it.” It belongs to one of communist political leaders and illustrates the ideology of national economy at that time. During the last years the Russian Federation became a part of international organizations such as G8 and has ratified a number of international conventions related to environmental protection. This made clear that environmental legislation should be updated and the situation when “Environmental economics– science of choosing and making affective decisions” (Fedotova, 2006) must be changed.

Efficient governmental management and control in a field of environmental protection is possible only on the strong basis of comprehensive legislative framework which can provide sustainability and predictability of state environmental policy. (MNR, 2006) Analysis of the current situation shows that governmental officials started to develop economic instruments as possible key factors for state environmental management. As it was considered in frame of the concept of Ecological Code developed by the Ministry of Natural Resources of Russia, the main guideline of the improvement of the acting environmental legislation is to balance ecological and economic interests of the society. (MNR, 2006)

At the moment the system of economic mechanisms adopted by the acting environmental legislation includes the following: environmental payment, administrative fines and indemnification for violation of environmental legislation. Existing economic instruments are characterized as particularly fiscal and not efficient. Restrictive economic measures prevail in the current Russian legislation. At present, the only active measure of economic influence on economic entities is payment for adverse environmental impact (Fedotova, 2006) which is based on the complicated scheme of standards and limits. Methodological and economic basis of national system of environmental standardization was formed in 1980s. The principles for the existing system of payments for adverse impact were laid down as early as in 1992 in the Decree of the Government of the Russian Federation, and they have not been reviewed since then (Governmental Regulation, 1992).

The present system of environmental payment in the Russian Federation is meaningless from the economical as well as ecological point of view. The prevalent practice of reduction of environmental payments for industries has a lot of shortcomings such as individualization of decision making by responsible authorities, exhaustive list of the environmental activities to be implemented by nature user and uncontrolled indices of factual impacts. The system of permits for emissions and discharges of pollutants, which has developed in Russia, is aimed at collecting environmental payments. The system is based on a complex set of strict standards and norms and de facto established payments for the "right to pollute the environment". It is not transparent, facilitates corruption, does not stimulate industries to implement environmental activities and does not correspond with acting Russian environmental legislation. As a result a decrease of negative environmental impact was not reached. In the course of time this economic mechanism has lost its control lever. (pers.comm. Gavrilov). There are no tax incentives or accounting of payment for nature users (Fedotova, 2006). In actual practice of the Russian tax system all environmental activities demand expenditures from enterprise and do not lead profit. It means that there are no actual economic incentives envisaged for development in the Law on Environmental Protection (Federal Law, 2002) in the Russian Federation. Besides, lack of coordination among different nature protection bodies participating in issuing permits results in long and intricate procedures for issuing permits that often contradict to each other (State Duma, 2005).

Current environmental practice and indicators of environmental quality show that command methods are not efficient enough while incentive-based regulations are lacking. It is obvious that it will be needed to change the current legislation and regulations in order to remove the deficiencies of the existing nature protection regulation in terms of reducing negative environmental impact by industrial enterprises. Besides, the institutional structure is to be reviewed, and responsibilities of respective authorities are to be clearly defined. More of that it is of great importance to identify the role and the weight of available policy measures that are to be implemented on the all levels of state administration. The cooperation between encompassing

stakeholders with active involvement of all target groups can be realized through the efficient and comprehensive system of economic instruments.

Russian companies are gradually turning into global players that occupy a serious place on the international markets. "Gasprom" is the largest gas company in the world, and Rosneft in 2006 announced about the intention of catching up with ExxonMobil and by 2010. Merging of companies RUSAL and SUAL in 2006 resulted in the aluminum producer second to none on the planet. Actions of those Russian companies on the domestic and international markets will make serious long-term consequences for the sustainable development globally. Russian companies, especially those in the extracting and heavy industries, buy assets abroad at a large scale and make international investments. Therefore, the international society has to make a right picture of those transnational corporations and understand how they will run their business, first of all in developing countries, and especially from the point of view of environmental liability (WWF, 2007). Environmental issue is an effective tool for competition and a source for permanently growing risks to business. On the grounds of environmental attitudes of a company other companies will position themselves on export markets. Limitations for supplying goods that do not meet environmental standards for production means and quality of the product will make even domestic market vulnerable.

Comprehensive and efficient system of environmental protection based on the collaboration between private business sector and governmental bodies is one of the prerequisites for the rapidly developing country such as Russia to become an equal player on the international market. (pers. comm. Pluzhnikov). At present, the need has arrived to reform the environmental policy of Russia. It is important not only to identify priorities of governmental regulation of environmental protection but also to choose specific measures for their implementation. The results can be achieved only by means of interaction in the specified area of the government, business and society.

Taking into account rapid economic development of the country, incentive-based instruments are efficient mechanisms that facilitate the implementation of environmental regulations and motivate private business sector to implement activities aiming at the reduction of ecological impacts. Business-to-government partnership realized with the help of effective economic mechanisms is one of the measures aimed at increasing the rate of economic development of Russia. More than that, one of the ways to present the country's image in a positive way is to harmonize national regulatory system with international environmental norms and standards. (TACIS, 2003). Currently fulfillment of requirements made for the ecological compatibility of the goods is becoming one of the competitive privileges for private enterprises.

The goal of economic instruments is to stimulate desirable behavior and discourage not desirable one by using monetary instruments. This can include all positive or negative incentives, which result in financial benefits or costs to the ones it is aimed at. Stimulative development of ecologically balanced and environmentally friendly productions and technologies can decrease to minimum environmental damage. The leading position in such kind of environmental management should be allocated to the incentive-based economic instruments provided with strong legal ground. It will contribute to decrease of environmental expenses, will increase efficiency of natural resources use and environmental protection. Among the issues that require attention in terms of achieving visible result in the field of business-government environmental cooperation is the demand side, i.e. strict policy measurers and regulative instruments aiming at making environmental activities to be desirable by industries. This issue is probably the one that has to be addressed in the first turn, and the main goal of such measures is to influence the case before it takes place.

The system of economic incentives for industries which is used worldwide (e.g. voluntary agreements, grants, technical assistance, various informative instruments, governmental investments and subsidies), and which has made a good showing during the last decades is poorly developed in the Russian Federation. Given underdevelopment of economic mechanisms and economic tools in the area of environmental management, investigation and analysis of world trends and foreign experience is very up-to-date. Given underdevelopment of economic mechanisms and economic tools in the area of environmental management, investigation and analysis of world trends and foreign experience is very up-to-date. If we turn to the experience of developed European countries, the most important legal document of the European Union in this respect is the Council Directive concerning integrated pollution prevention and control. The Directive is the fundamental document, which identifies key principles for issuing comprehensive nature protection permits. The basis for issuing such permits is implementation of best available technologies (BAT). Being based on the principles of system approach to environmental protection, the Directive suggests flexible and achievable conditions for implementing environmental activities at large industrial facilities (Directive 96/61/EC).

During the last decade, Russia signed several international conventions and agreements, including Kyoto Protocol, in accordance with which the country is obliged to reduce the negative environmental impact, what is possible by means of the best available technologies. At the same time, there is still no legal basis for using the best available technologies, and not a single statutory act was passed securing their implementation. Lack of respective legal basis does not allow the enterprises to create conditions for obtaining additional resources via the opportunities envisaged in the current legislation on granting privileges and participating in target programs.

Definitely the foreign experience in the area of creating comfortable conditions and incentives for private sector to implement environmental activities cannot be fully applied in the Russian Federation due to regional and economic features of the country. The norms concerning increasing the effectiveness of the interactions between state bodies and business in the area of environmental enhancement can be integrated into the environmental law of the Russian Federation in the process of harmonizing Russian environmental law with the legislation of developed countries (TACIS, 2003). One of those measurers is provision of economic incentives that can be presented with a complex of regulatory and economic norms that can restrict activity of industries that can be harmful for the environment and at the same time motivate and encourage business sector for the implementation of environmental actions.

The final objective of the presented study is to identify what approaches governmental executive bodies can integrate in legislation on environmental protection to build an efficient system of economic incentives for industries. The review of national legislation in a field of environmental protection, foreign practices and academic sources are supposed to give an overview about the general approach to economic incentives in developed world and in the Russian Federation from the point of view of drafting fundamental legislation in the related field and from the side of experience of business representatives in the implementation of the regulations. It is anticipated that the analysis of the proposed acts and reports will facilitate identification of the barriers and obstacles for building and realization of efficient system of economic instruments that let involve industries in initiation of environmental activities.

# 2. Methodology

## 2.1 Preliminary study and formulation of research questions

The preliminary study of the research problem was started in frame of the ARPEA course. The paper presented aimed at analyzing stimulating economic tools – existing in the Russian Federation at the moment - for the industrial sector that would contribute to enhancing the quality of the environment. Two main research questions were formulated to structure the work:

- What are the existing economic incentives available for industrial sector in the Russian Federation?
- What are the obstacles for the development and realization of efficient system of economic instruments?

In order to form a possible strategy for elaboration and implementation of the effective environmental legislation which will provide comfortable conditions for all actors involved in industrial processes the legislation in the field of environmental payments and economic incentives was analyzed in the ARPEA paper. To identify the gaps and shortcomings of the system of economic incentives which currently acting in Russia the following documents and materials were reviewed:

1. Laws on environmental protection, general principles of the organization of activities of governmental executive bodies, atmospheric air pollution and other related regulatory documents such as Code of Taxes and Criminal Code;
2. Governmental decrees and departmental orders that approve environmental norms and standards as well as rates for environmental payment;
3. Scientific researches and governmental reports in the field of economic instruments facilitating environmental protection in Russia

The findings and information collected was used as a starting point for thesis research.

By means of the study it was revealed that the research questions mentioned above as well as the data selected does not give full overview of the situation. Through the preliminary research it was discovered that the difficulties with the formation of the new legal concept are caused by the following:

- there is no clear definition of stimulative economic mechanisms in the Russian environmental legislation;
- the definition of economic incentives implied in the Russian environmental legislation does not coincide with the notion used in the legislation adopted in developed world especially in European Union;
- aiming to harmonize the Russian environmental legislation with the international norms and standards it is necessary to study acting environmental legislation of countries with wide environmental practice (Sweden, Germany).

As a result of the mentioned above the list of research questions was enlarged with the following:

- What is the definition/notion of economic incentives in developed states?

- What are the successful examples and achievements in the identified area realized by developed countries that could be used?
- What are the possibilities for improvement of the current system of economic instruments in Russia?

Thus the data selected was amplified with academic sources in a field theoretic ground of economic incentives. Books, monographs, textbooks on environmental economics viz literature on market-based or incentive-based instruments was studied in order to define a notion of economic incentives that is used in other countries and can be applied to the Russian legislations.

## 2.2 Methodology selection

As it was mentioned the presented study aims to answer few main research questions. The methodology of the paper was planned and structured in accordance with availability of information, academic or practical, which will lead to answers. The main part of the research can be identified as qualitative i.e. provides the keys "to understand the meaning of social events for those who are involved in them" (Esterberg 2002). More of that qualitative research gives space for "the art of interpretation" which is the base for the creation of meanings (Esterberg 2002).And at last, it should be taken into account that "In comparison to quantitative researchers , qualitative researchers tend to give much less information about how they analyzed their data" (Esterberg 2002).

Taking into account that "no single method ever adequately solves the problem of rival causal factors" (Denzin 1978) two types of *triangulation* method identified by Denzin were used in the study. First, *data triangulation* defined as "the use of a variety of data sources in a study" was applied to the materials collected: Russian national legislation, international regulations and norms, academic researches, book and monographs in a field related to study, media sources, official statistics and interviews with scientists and experts from official authorities, industries and NGOs. Second, *methodological triangulation* meaning "the use of multiple methods to study a single problem" was unavoidable in that case. The methods were applied in accordance with the particularities of the data found. In the following the research process will be described.

## 2.3 Academic sources and policy analysis

As a systematic approach policy analysis gives possibility for variety of choices. Henk Jan Verhagen in "Policy Analysis Methodology" (1998) states that policy analysis "is not a single method or technique, or even a fixed set of techniques". The definition of the policy analysis given by the author is the following: "Policy analysis is an inquiry whose purpose is to assist decision makers in choosing a preferred course of action from among complex alternatives under uncertain conditions." More of that, it is mentioned that the purpose of policy analysis is not to replace the decision makers but to clarify the problem, outline possible alternatives and foresee consequences. One of the aims of the presented research is to formulate a basic concept of new legislation in a field of stimulative economic mechanisms for industries in Russia. In other words alternatives for decision makers are to be identified. Thus, the definition of policy analysis mentioned above has been chosen as a starting point.

In the same study Henk Jan Verhagen proposed a framework for policy analytical approach that was used in the research. The steps are the following:

- problem analysis
  On this stage "the problem is made as concrete as possible and the area to be studied is limited as much as possible" (Verhagen, 1998). Relative to the investigation presented the problem was divided into two main directions of study defined as uncertainties in definition of economic incentives and lack of stimulating economic instruments in Russian national legislation. Thus, through the problem analysis the optimal definition of economic incentives is to be found. After the definition is formulated the main area to be studied is acting Russian legislation in a field of stimulative economic instruments.

- generation/preselection of alternatives
  Using the results of the problem analysis "a combination of measures which solve the problem sufficiently" is to be proposed on the second stage (Verhagen, 1998). In our case the alternatives of measures/instruments are to be chosen from the varieties of mechanisms that are provided by the existing national legislation in Russia. More of that in order to ensure that the research is full and comprehensive the best practices of economic incentives implemented in developed countries were included in the list of alternatives as possible solutions.

- determination/ranking of alternatives
  The last step of the policy analysis framework aims to compare "the effects of the various alternatives". "This can be done by means of an effect-overview" which can be qualitative or quantative (Verhagen, 1998). For the purposes of this study the qualitative approach was chosen viz the effects of economic instruments on the overall state of environment as well as their influence on interrelations of involved stakeholders. The findings are presented in the chapter….

In addition remembering that qualitative research was defined as leading methodology, *content and interpretative analysis's* were applied to the studying process. The content analysis meaning "systematic, objective, quantative analysis of message characteristics" (Neuendorf 2002) was used in order to examine academic sources and Russian environmental legislation.

Recognizing the importance of involvement of primary sources to build strong theoretical base for research various academic sources were analyzed. In order to get the clue of the economic incentives identified for the study as preferable solutions the data was interpreted to form theory from the messages observed. First, it was necessary to understand nature of stimulative market-based instruments in order to distinguish those instruments from other measurers existing in environmental economics. Second, definition of economic incentives that can be applied to the Russian situation was formulated.

Through the analysis of the Russian legislation the number and the notion of economic incentives introduced in acting norms and regulations were identified. More of that it was of great importance for this particular research to identify the links and connections that are crucial in a field of economic stimulation. Usually policy and regulations as source material does not give clear understanding of level of the involvement of one or another actor. Uncertainties are conditioned on specific terminology and necessity of legal background

to recognize the meaning of the law. Content analysis of acts assists examination of human interactions i.e. helps to understand interrelations of encompassing stakeholders.

## 2.4 Interviews

In order to provide the research with practical examples and amplify the problem analysis with expert opinions, few interviews were conducted in frame of the study. The interlocutors were chosen depending on their experience and relevance for the study. The information about the number and background of people interviewed presented in Tab. 1.

| № | Name | Company/ Organization | Position | Background |
|---|---|---|---|---|
| 1 | Mikhail Zhukov | State Duma of Russia, "Agency of systems analysis of environmental risks" | Member of the Higher ecological council (State Duma of Russia). Deputy head of research advisory board of "Agency of systems analysis of environmental risks" | Foundation of the system of environmental rating for companies in Russia. Scientific work in a field of environmental protection and nature use. |
| 2 | Galina Peretruhina | Nornikel | Senior manager of the Department of Federal programs | Development of proposals on the collaboration of private business sector and government. |
| 3 | Oleg Pluzhnikov | Ministry of Economic Development of Russia | Deputy Head of the Department of state regulation of tariffs, infrastructural reforms and energy efficiency | Elaboration of legislation in a field of environmental protection in particular environmental control and expertise, mitigation of climate change, renewable energy development. Realization of energy efficiency projects in collaboration with Russian and foreign companies. |
| 4 | Dmitriy Vostrikov | Ministry of Economic Development of Russia | | Development and improvement of special Federal and departmental financial programs |
| 5 | Vsevolod Gavrilov | Sberbank | Head of the Directorate of Energy Efficiency and Nature Use | Development of legislation on environmental protection and nature use. Development of economic instruments for environmental protection. In the past, leader of interministerial group responsible for elaboration of the Water and Land Codes of Russia |
| 6 | Konstantin Romanov | Gasprom | Main technologist | Elaboration of annual environmental report, monitoring of environmental legislation |

Tab 1-1 List and background of interviewees

All experts who were interviewed for the purposes of the research are high qualified professionals. Their opinions can be based on data and background that is not available for the researcher because of lack of knowledge or specificity of topic which is not the field of the study itself but related to the research marginally. That is why it was of great importance "to allow interviewees to express their opinions and ideas in their own words" and "to move beyond our own experiences and ideas" (Esterberg 2002).

Taking into account all mentioned above for the purposes of the study two types of interviews were chosen as appropriate – *semi-structured and unstructured.* The difference between these two survey approaches is the following. In semi-structured interview researcher set up a framework of conversation for the interviewee with some main ideas or even freeform questions. The goal of the interviewer is just to identify the area of discussion while "the interviewee's responses shape the order and structure of the interview" (Esterberg 2002). To direct the interlocutors towards the area of the study short lists of questions were composed, separately for state officials and companies. The differences were connected to the dissimilarity of levels of power in decision making process. The representatives of governmental bodies can change the situation through elaboration of legislation while companies are only users of acting norms and laws.

For unstructured interview "the interviewer typically does not have a set of questions prepared in advance" (Esterberg 2002). Such type of survey was used only once in order to study the scheme of governmental investments and subsidies that companies can get in frame of special federal and departmental programs for implementation of environmental activities. This area is not connected directly with the research topic but conjunct with development of possible incentive-based instruments. As far as the researcher has no experience in this field the interviewee was free to share his opinion and provide any kind of information that he found useful. "An informant, familiar with the problem being studied, may be in a much more advantageous position to analyze and interpret on-going events than the researcher" (Doby 1967).

It is necessary to mention that the number of interviews taken is definitely not enough to make a full overview of the situation. As it was mentioned above the main body of the research is based on the policy analysis. That is why mostly the representatives of governmental authorities involved in the state management of environmental protection were included. The chosen interviewees are middle and high level state officials responsible for or involved in decision making process related to the development of economic instruments.

In order to get impression about interaction of acting environmental legislation and consumers it is important to contact industries directly. Due to the limit of time assigned for the research the representatives of only two big companies were interviewed, Gasprom and Nornikel. To cover the lack of data, the results of the survey "Russian companies in the 21st century" presented by WWFs Russia Trade and Investment Program were used. "This report therefore reflects the results of a survey of 315 of the largest companies in Russia, aimed at establishing their views regarding environmental sustainability and corporate social responsibility" (WWF Russia 2007). Out of 315 companies contacted 67 responses have been received where such sectors as oil and gas, forestry, ferrous and non-ferrous metals and chemical were the most active. The questions included in the survey and directly related to the thesis research are the following:

- existence of companies' specific budget for environmental activities;
- application/use of environmentally friendly equipment and its influence on company's productivity and costs;

- level of companies' compliance with environmental legislation;
- possible measures for encouragement of Russian companies for environmental activities.

Thus, using the WWF's survey and the information provided by the state officials, scientists and companies contacted it was possible to make an overview of interrelations between theory and practice.

## 2.5 Scope and limitations

*Scope.* This research is aimed at deficiencies of the Russian system of economic instruments for environmental protection, with focus on possibility to implement economic incentives on the base of best available technologies. Geographically the scope of the investigation includes the Russian Federation, for which the analysis of acting legislation is performed. The scope includes the issues related to stages of policy development and improvement in a field of environmental management – analysis of existing policy with the identification of available incentive economic instruments, review of current practices of industrial sector as well as empirical side of federal authorities functioning and formulate of possible ways for improvement and reforming. Main stakeholder categories that the research aims at are bounded with governmental agencies responsible for elaboration of legislation in a related field and large-scale companies operating in industrial sector.

*Limitations.* Research aims to get an overview of the existing system of economic instruments for environmental protection in terms of its applicability, efficiency and cost-effectiveness for business community. The limitations of the analysis done are the following:

1. Taking into account that the author focused on the business-government relations the analysis of the possible effect of the proposed solutions on society (ex.: health issues, economical state of regions before and after the implementation).
2. The geographical scope of foreign experience in the area of economic incentives is limited with European Union countries.
3. The interviews made in frame of the paper do not include wide range of industries as representatives of industrial enterprises responsible for environmental issues are hardly available. Nevertheless, to cover this gap the report prepared by WWF Russia based on the interviews with 315 private companies including industrial sector was used.

# 3. Literature review

## 3.1 Economic instruments: theoretical base

It is obvious that the issue of environmental pollution in developing countries will not disappear all by itself. Many experts admit that institutional factors make a significant impact on the interdependence of the profits and aggravation of the environment. Availability of natural resources and their condition is an integral part of the well-being of industrial enterprises. It is important to realize that economic development is not only a barrier for solving those problems, but it contributes to their solution (Asafu-Adjaye, 2000).

In early 20th century, Arthur Pigou, an English economist was the first to formulate the interdependence between environmental pollution and economy. The analysis by Pigou was a basis for making different between private costs (costs for production and consumption ) and full social costs (full cost of the product, including the costs for covering damages to the environment inflicted during production) (Turner *et al.* 1994). Later, environmental economics became an independent science. Environmental economics is defined as "study of the impact of economic activity on the environment as well as the influence of the environment of economic activity and human welfare" (Asafu-Adjaye, 2000). "Economic instrument" is a notion used in environmental economics. By definition of OECD, economic tools are financial burden of nature users which in some cases might stimulate reduction of environmental pollution. An alternative can be financial incentives in the form of subsidies aimed at reducing environmental impacts from production activities. Many economists support the use of economic tools as economically beneficial, flexible and effective mechanisms of environmental policy (OECD, 1989).

At present there is a great many economic tools applied for regulating environmental impacts (Appendix 1) – " Pigouvian taxes, quotas, subsidies from pollution reduction, marketable emission permits, deposit refund systems, assignments of legal liabilities, etc. " (Laffont, 2000). In relation to that, selection of the tool which will be the most applicable and effective in a specific political situation and for a specific country is the key issue of environmental economics. Policy will be cost-effective in the case if costs for improving environmental quality are equal or exceed the amount of used natural resources (Field and Field, 2006). Availability of effective economic tools engaged in the implementation of environmental policy is one of the main criteria of the effectiveness of the system on the whole. "Important criterion that must be used to evaluate any environmental policy is whether that policy provides a strong incentive for individuals and groups to find new, innovative ways of reducing their impacts on the ambient environment" (Field and Field, 2006).

Norton (1984) formulated a series of actions necessary for choosing pollution control policy:

- identification of political measures and environmentally-friendly technologies are available at the moment;

- formulation of goals and principles for pollution control policy with the account for the type of pollution and their hazard for the environment, existing measures for controlling that pollution as well as full social costs of pollution control;

- identification of political tools that are the most economically effective for achieving those goals and principles.

Economic efficiency

Low information requirements – minimal amount of accurate information are required and the costs of updating it should not be prohibitive

Administrative cost – complex, highly technical schemes requiring large amounts of information run a high risk of failure or very limited effectiveness

Equity – heavily regressive schemes are to be avoided

Dependability – environmental effectiveness of the scheme should be as reliable as possible given the inevitable uncertainties

Adaptability – the system should have the capability to adapt to changing technology, prices and climatic conditions

Dynamic incentive – the system continues to encourage environmental improvement, and technical innovation; beyond policy targets if this is feasible

Political acceptability – does not represent too radical a departure from prevailing and likely future practices and underlying philosophies

*Source: Turner, R.K., Bateman, I. & Pearce, D.W., 1994*

It is very important that the tool chosen was not inly effective, but equitable, administratively feasible, dependable and provides dynamic and continuing incentives for improvement (Turner *et al.* 1994).

One of the ways of environmental management is building up a centralized or decentralized system. Centralized system requires permanent control from a governmental administrative body. For making such a system more effective, the authorized body should be well informed about what is going on locally. As a rule, when studying the environmental policy of different countries, key attention is paid to the work of public officials, because they are the source of important political decisions. Most political systems, especially at the federal level, control the level of emissions from a group of enterprises (enterprises of one sector or one region), and not from one source of pollution. Nevertheless, one should take into account that industrial companies and other representatives of private business identify the level of the negative environmental impact. Effectiveness of the decentralized system depends on the interactions among many stakeholders with the decision-making right, and each of them assess the situation differently (Field and Field, 2006).



## Command and Control (CAC) and Incentive Based (IB) approach

In terms of the interactions between business and government, two approaches to organizing environmental management are distinguished: Command and Control (CAC) and Incentive Based (IB) approach.

"CAC (command and control) – traditional regulatory approach" (Sterner, 1999), where 'command' means that environmental pollution cannot exceed a certain established limit, and 'control' means that meeting the norms is secured by compulsory measures, and all actions are carefully traced in the framework of governmental environmental monitoring (Asafu-Adjaye, 2000). Norms and rules established within that approach are binding, and legislation limits the volumes of environmental impact (Sterner, 1999). This regulating approach is based on direct orders of federal authorities that give the right "to do or not to do

something". Traditionally, in countries like Germany, Sweden and the Netherlands, the regulative environmental management system was the basic one. Also that system traditionally includes monitoring and fees in case of violating the instructions (Turner *et al.* 1994). "Regulatory instruments can be described as institutional measures aimed at directly influencing the environmental performance of polluters by regulating processes or products used, by abandoning or limiting the discharge of certain pollutants" (OECD, 1989).

The key tool of such an approach are different standards that are implemented by different compulsory measures established in the legislation (Turner *et al.* 1994). "Standards are popular for a number of reasons. They appear to be simple and direct. The apparently set clearly specified targets" (Field and Field, 2006). A special feature of such tools is that nature user has no choice. The polluting company has to fulfill the instructions or be punished administratively or by court decision (OECD, 1989). The problem of their practical implementation lies in choosing a target group. One should identify if the standard is applied to all situations, sectors and nature users or it varies depending on the situation (Field and Field, 2006).

There are two types of standards: ambient and emission. *Ambient standard* are expressed in qualitative indicators of the environment. It can the quality of the air in a certain city or quality of water in a certain river. i.e. ambient standard stands for contents of some pollutant that cannot be exceeded. Such s standard cannot be observed directly. Emissions should be controlled that impact environmental changes. The notion "*emission standard*" directly applies to the amount of emitted substances. As a rule, calculations are made on the basis of the material used per a time unit (for instance, gram per minute). Besides, there are standards, application of which implies no specific results. Establishment of such standards is related to the use of specific technologies and practice, that must be used by a nature user. This id a *technology standard*.

The key difference among those standards is the way of achieving them. Emission standard can be met my any means that are the most beneficial for the enterprise, whereas the technology standard binds to make certain decisions and use a limited number of technologies (Field and Field, 2006). Regardless of how strict the standards are, possibility to observe them depends on the effectiveness of compulsory measures and permanent environmental monitoring (Sterner, 1999).

One of the most significant disadvantages of CAC schemes is badly organized information exchange among administrative bodies and companies. Karl Marx noted in his works was economic development of the state can be limited by lack of understanding and coordination among social and political groups within national economy (Turner *et al.* 1994). Disadvantage of environmental monitoring, being consequence of poorly developed legislation in this area, is one of the reasons for inefficiency of environmental policy on the whole (Asafu-Adjaye, 2000).

Many experts believe that, as a rule, government is not sufficiently aware of the consequences of specific actions. Besides, the government is often the cause of environmental crises (Turner *et al.* 1994). Lack of information is one of the key barriers for effective management. "The gain from delegating discretionary power to politicians comes from the use they can make of their information…" (Laffont, 2000). Any economic system or mechanism, first of all, is a process of communication, "where each agent transmits messages to which other agents respond according to their self-interest" (Sterner, 1999). In Russia it is lack of effective monitoring system "aligning" of environmental reports by regional authorities with the optimal required level, and adoption of norms without the account for the opinion of the subjects to the norms.

Practice shows that pure CAC regulations occur very rarely. Rather norms and measures are modified in each specific case. Individual approach to making administrative decisions and establishing standards is defined by

executive authorities depending on the results of evaluating activities of the company. In that case we mean nature protection activities of the company and the amount of pollution abatement costs (Sterner, 1999). In practice, the norms strengthened with strict penalties better motivate companies that low taxes for emissions (Sterner, 1999).

## Incentive Based approach

Economic incentives or market-based instruments (MBIs) are definitions that are used for describing any political reforms based on market relations aimed at improving environmental quality (Sterner, 1999). Incentives are some sort of economic technique which allows to direct people's decision in this or that direction (Field and Field, 2006). There are some economic incentive instruments that can be used for encouraging environmentally-oriented business (Turner *et al.* 1994).

The motivating effect of economic tools is expressed in the following:

- direct change of the price or price level

Mainly charges that are accounted for in the cost of the product or production process as well as when using deposit-refund systems

- indirect changes to the price by means of financial and fiscal mechanisms

Result of providing subsidies or realization of other fiscal mechanisms for introducing environmentally-friendly technologies.

- creation of or support to a specific block of services or type of activities

As a rule results from legislative changes. Also support to the marker is required from public organizations for stabilizing the price situation on the whole or for a specific marker of services (Turner *et al.* 1994).

As Hanley (2001) rightfully noted: "Environmental protection costs money". It has been noted many times that companies react compulsory measures just like common people. In our case, the most effective stimulus is prices (Hanley *et al.* 2001). On the whole, the notion "economic", as a rule, implies some financial component (OECD, 1989). Market-based instruments are based on price values or other economic values that can encourage economic agents to reduce environmental pollution. In fact, economic incentives require not so much of actions but investments. The principal difference of this mechanism is that IBs encourage rational nature users to change their behavior. Changing attitudes to consuming natural resources allows to reduce the negative impact payments even despite of the increase of rates, and – as a result – to reduce emissions (Turner *et al.* 1994).

Economic tools are especially effective for the industrial sector. Initially all enterprises work in the framework of certain incentives. Under market relations, those tools are mainly aimed at growing the capital of the company. Industrial companies get an opportunity to use the advantages of any available factors in order to improve economic performance (Field and Field, 2006).

IBs can be voluntarily used by enterprises. Despite the fact that the price for emissions is fixed, a company or any other person can choose how to change its behavior and reduce environmental damage (Hanley *et al.*

2001). When implementing IBs, public authorities develop general goals and rules. Within this framework companies have sufficient freedom to apply economic tools contributing to the implementation of cost-effective programs on reducing the negative environmental impact (Field and Field, 2006). In contrast to the regulatory approach, economic tools give nature users the right of choosing the way of meeting the instructions or achieving necessary levels in the way most beneficial for the company (OECD, 1989).

One of the advantages of incentives is that even the use of low-cost stimulating mechanisms for the enterprises of one sector makes positive impact on the environmental quality on the whole. Introduction of incentives program in one economic sector allows introducing stricter norms for the enterprises of that sector, what will reduce the average environmental impact of the sector. It will allow to increase the norms that are easier for companies to achieve (Sterner, 1999). Besides, this approach is not only financially profitable for enterprises, but it also allows to reduce consumption of natural resources. For instance, the owner of a mineral deposit can increase his income by postponing extraction of natural resources for a certain time. Introduction of environmentally-friendly technologies providing for the reduction of natural resource consumption gives such an opportunity (Turner *et al.* 1994).

One of the incentive economic tools is *environmental tax (charge)*. Collection of charges for environmental pollution is based on Polluter-Pays Principle (PPP) (Asafu-Adjaye, 2000). In fact, a charge or tax is "negative price that is levied in proportion to the amount of pollution". To a certain extent, charges are the price of the pollution itself (OECD, 1989).

Experts identify the following functions of the environmental tax:

- it allows to cover the costs for environmental protection from the governmental budget;

- it secures incentive effect for enterprises;

- it increases revenues (here "state income") (Hanley *et al.* 2001)

Following the rules of Pigouvian tradition, economists often support the use of taxes (or subsidies). According to the opinion of the experts, such an approach helps control externalities, because in that case the tax for a certain type of activities equals marginal social damage, i.e. the amount of the damage this activity inflicts to the environment (Baumol and Oates, 1996). In theory, the environment tax should raise the effectiveness of the market of of the environmental goods and services. The environmental tax should be established in such a way that its amount is "equal to the marginal costs (marginal environmental damage costs)". And the environmental tax becomes an effective economic tool only if the authorities calculate those costs correctly "provided that no other major imperfections distort the relevant markets" (Sterner, 1999). In practice, in most cases the rate of charges is too small to have a stimulating effect (OECD, 1989).

Emission taxes are one of the types of the environmental tax . Sterner (1999) identifies the following features of this economic tool:

- simplifies the monitoring of polluting substances;

- reduces the costs for environmental recovery;

- does not require additional administrative costs as it is collected in the framework of the general state system of taxes and fees;

- the tax can vary depending on the region with the help of regional coefficients and rates.

In the Russian system they use that OECD calls effluent charges, i.e. "charges to be paid on discharges into the environment and are based on the quantity and\or quality of discharged pollutants" (OECD, 1989).

Often times, economists prefer charges to other economic tools because it is believed that high rates motivate companies to reduce emissions and find economically beneficial solutions. Compared to the standards, charges secure a better incentive for introducing innovative technologies for reducing charges for the negative impact (Asafu-Adjaye, 2000). One of the advantages of the tool is long-term motivation for the nature user. Charges make not just make short-term decisions but change behavior on the whole. As a rule, it works in the form of searching more economically beneficial solutions for companies and less polluting technologies (Turner *et al.* 1994).

Technological development with the aim of environmental protection is one of priorities of the environmental policy in the modern world. One of the key advantages of charges is that they give strong incentives for searching economically beneficial (cheaper) solutions for reducing emissions (Field and Field, 2006).

*Subsidies* are an alternative to the environmental tax. Actually subsidies have the same stimulating effect as charges. A subsidy is a form of financial help which should be an incentive for nature users with the aim to change their behavior in relation to the environment. Also subsidies can be provided to companies that experience difficulties with fulfilling environmental eduction and meeting the necessary level of emissions (OECD, 1989). Government subsidizes the pollutant per emission reduction units. Also subsidies can be provided for purchasing new equipment or technologies that allow to reduce environmental pollution (Asafu-Adjaye, 2000).

There is one more mechanism, *marketable (or tradable) pollution permit*, which is a new economic tool that was presented in the framework of Clean Air Act in the United States in 1977. The main mechanisms of the system are pollution loans and pollution allowances. Pollution loan is a loan which a company gets in case of reducing and maintaining the pollution level lower than the standard. This loan can be sold to other companies, pollution level of which does not meet the norms, but due to impossibility of reducing production environmental impact reduction is difficult. In accordance with the pollution allowance, a company gets a permission for emitting a certain amount of pollutants. Artificial markets can be created in case if there is demand for buying the rights for the existing or potential environmental pollution. Also the market works if participants want to sell "pollution rights" or recycled materials (OECD, 1989).

Nominally, marketable permit system can be divided into three stages. At the initial stage the government identified the admissible emission level for a certain region. Then on the basis of the standards the government issues a certain number of permits. For instance, if 150 emission units were approved for the region, then 150 permits will be issued. After that the government creates market for permits in the region. Prices for permits are fixed on the basis of the indicators for the demand and offer (Asafu-Adjaye, 2000).

A British economist Ronald Harry Coase, maintained that the pollutant and the sufferer should be left all by themselves and should not be controlled too much. The Coasian tradition totally denies interference from the

state (by taxes, subsidies or standards) into the market. According to Coase market as such is possible only on the grounds of private property. In that case the necessary (optimal) environmental level can be achieved for the society. But taking into account that natural resources and the environment are not goods suitable for free market, legislation for regulating economic incentives and rights for private property are necessary anyways (Turner *et al.* 1994).

Advantages of tradable emission permits have a lot in common with emission taxes. However, some considerable disadvantages are highlighted. First of all, operational costs, as a rule, are higher than emission taxes require. Secondly, emission permit trading is not that easy if there are just several enterprises in the scheme. Effectiveness of the system on the whole depends on the number of participants and their readiness. However "organizing the emission permit trading in a low-cost fashion, for example in terms of a permit exchange, helps to reduce transaction costs to the firms" (Sterner, 1999).

## Differences between approaches CAC and IB

Advantages and disadvantages of the approach of CAC и market-based incentives have always been subject to close attention and discussions for economists (Turner *et al.* 1994). It is not always possible to identify the nature of the political tool, i.e. if it is economic or regulative one. Even if theoretically the tool belongs to a certain group, its practical implementation can be different (OECD, 1989).

Many experts believe that MBIs are more preferable mechanisms for managing natural resources compared to CAC. It has been noted that traditionally economists and politicians are prone to overestimate the advantages of direct regulation measures by the government (Randall, 1996). "MBIs are generally preferred over CAC approaches because they offer an economic incentive to reduce pollution". However, authoritarian CAC mechanisms are more preferable in cases when there is unclarity in terms of human health impact (Asafu-Adjaye, 2000)

Stimulating economic tools are supported by many economists. From the point of view of benefits for enterprises "incentive-based (IB) regulations generally provide lower average and marginal abatement costs than command and control (CAC) type regulations" (Sterner, 1999). On the whole we should admit that costs for administering tradable permit or tax system are usually higher than managing the system of fixed standards and norms. Nevertheless, those economic tools allow to gradually reduce additional transaction cost of the company and they turn out to be more beneficial than CAC approach (Sterner, 1999). Nevertheless, despite the fact that MBIs are more beneficial for companies and they make profits for the government, costs for administering the system itself can be higher than for CAC (Asafu-Adjaye, 2000).

From the point of using standardization of the environmental quality, CAC approach is very inefficient. Standard means all or nothing regardless of the fact if the necessary level was achieved or not. If the level is achieved, then there is no motivation for improving the quality of production. Even despite the fact that the cost of emission reduction in that case might be very high. Standards do not give space for flexible decisions. In turn, technology standard, which is usually called "incentive based approach" by economists dictates pollutants what technologies to use even if there are less costly ways of achieving the same goals (Field and Field, 2006).

The biggest problem with standards is that they are usually established and applied by different people. As a rule, they are fixed by the government, and enforced by regional authorities. And the state authorities do not

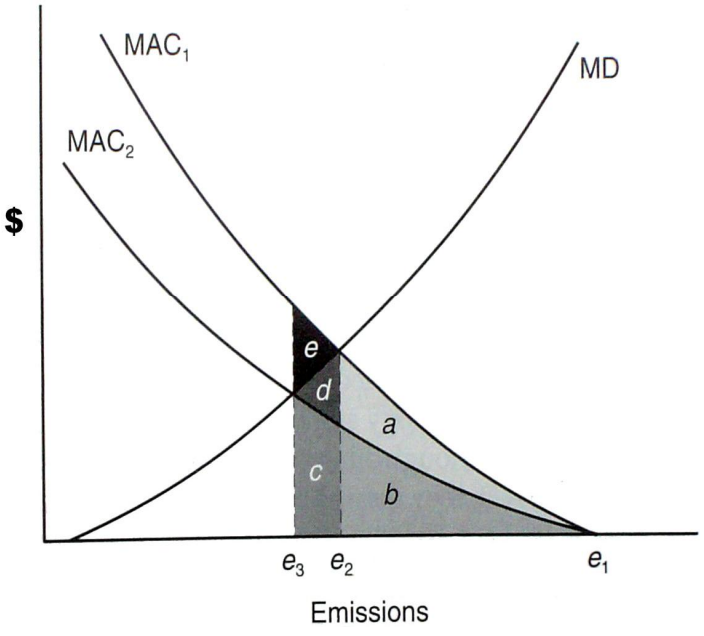
take into account the costs of the regions for the enforcement. It is assumed that local authorities distribute regional budgets and find necessary resources. Of course, in practice things are different. Taking into account the limits for resources, getting instructions from the higher level, the regional authorities implement urgent projects and cut the budget for long-term ones, like environmental protection (Field and Field, 2006).

"Another key distinction between regulations is how well they induce the development and adoption of new abatement technologies" (Sterner, 1999). I.e. the difference between those two mechanisms is in the force of action and persuasion. The mechanisms imply totally different approaches to the implementation of innovation decisions. CAC implies strict enforcement of legislation with no account for the interests of the company, whereas IB motivates for the introduction making it profitable for the company.

"There is now a wide body of literature suggesting that a policy mix should be preferred to single instruments in the pursuit of pollution control" (Sterner, 1999). On the whole, it is not a new solution for the environmental policy. In practice, is a collection of economic and command and control interventions that may appear, in ex post terms, a policy mix (Sterner, 1999). Unfortunately, historically such an approach has become economically unprofitable. As a rule, this disadvantage is determined by the lack of coordination among political, administrative and economic measures. For better results of the system of environmental management, clear coordination is required among internal market measures and their harmonization with other economic policy tools (Sterner, 1999).

Some experts believe that a political approach will be the best which makes any pollution illegal. But in practice, the most effective mechanism is that economic activities of a company is the basis for reducing pollution. Foe example, it can be taxes for materials that are hazardous for the environment. Therefore, forced to pay for emissions the companies search for opportunities to reduce them by changing technologies, switching to cheaper and more environmentally-friendly fuels and installation of additional treatment facilities (Field and Field, 2006). Environmentally and economically beneficial solutions can be achieved with the help of innovative technologies. In that case, innovations are not an independent unit for regulation but they are the most preferable means for achieving the goal (OECD, 1989).

Figure 3-1 Cost Savings from Technological Change




At present, introduction of innovative technologies with the aim to improve environmental quality remains one of the best acceptable ways. Let us consider the example of incentive effect of standards for the total emission volume.

Figure 3-1 shows two scenarios, where:

MAC1 – marginal abatement costs for upgrading technological process.

MAC2 - marginal abatement costs the company can count for when investing in treatment or recycling technology.

If there is no economic tool motivation, then the company has no incentive for investing in upgrading production. But let us imagine, that the enterprise needs to reach the emission level of $e_2$ tons/year. In that case, with the account for usual marginal abatement cost, the enterprise has to pay (a+b) per year. But if the upgrade was successful, then the cost will be just b/year. The difference of a\year is the sum of the reduction of the costs of the enterprise. Therefore, investments of the company in technologies will totally pay back (Field and Field, 2006).

Of course no economic tools can be implemented without certain organization and policies. In any case, working political system and its principles will effect the choice, implementation and consequences of a specific tool (OECD, 1989). Economists believe that if the market is allowed to develop freely and without control from the state, then a precedent might come up when inadmissible environmental quality level can be accepted as a optimal or average (Hanley *et al*. 2001; Field and Field, 2006). Development and dissemination of a new technology allowing to control pollutions is a comprehensive social and economic process. It is required to engage not only resources for creating and developing of the technology itself, but to take into account patent and author's rights and to support the company/sector responsible for production (Field and Field, 2006). In any case, some sort of control over the economic activities of companies is necessary from the government even if such activity is aimed at environmental protection. The control might be executed by legislation and/or stimulating economic tools, such as taxes and permits (Turner *et al.* 1994).

## 3.2 Experience of the foreign countries in prevention and control of industrial pollution

### EU Directive on comprehensive prevention and control of pollution

Analysis of foreign experience shows that at present, in European countries, legal regulation of burden on the environment (air emissions, water emissions, disposal of wastes) is made on the basis of the strategy of the best available technology (BAT). Today, the Russian legal basis for nature conservation activity is not an incentive for switching to environmentally efficient technologies. One of the serious hindrances for introducing BAT system is incoherence of the current Russian legislation to the international norms. Especially this concerns the key notions. Thus, the Federal law "Environmental protection" (Federal Law, 2002) contains the notion of «best available technology» without an explanation. The law does not specify the criteria for attributing technologies to that category, and there is no rationale for selecting those technologies. In the EU countries, BAT has been affectively introduced in all industrial branches for over 10 years (Council of Federation, 2008).



BAT – is a direst result of accumulated experience and research related to applying the strategy of cleaner production or preventing pollution and wastes at the source (Environmental protection program of the UN and Governmental strategy and policy in the area of cleaner production, 1994). The most important legal act of the European Union in this respect is the Directive of the European Council 96/61/EC of September 24, 1996 «On comprehensive prevention and control of pollution» (Directive).

The Directive requires securing a comprehensive approach to control over pollution. This means that air emissions, discharges into the water and terrain (soil) should be accounted for simultaneously and together in

order to avoid the situation the reduction of, for instance, air emissions leads to discharges into the water. The principal provision of the Directive is the requirement for continuous reduction of environmental impact. Despite the fact that the implied ideal of complete lack of any impact looks like utopia and technically not achievable, such a principal has allowed European countries to significantly reduce environmental pollution maintaining competitiveness of their industry (Tacis, 2003). One of the advantages of the Directive is that it optimally uses limited human and financial resources of nature conservation agencies and concentrates its efforts on the most polluting industries. Small and middle-sized enterprises are not covered with the document.

For creating the balance between the requirement to minimize the pollution and actual technical opportunities, the Directive envisages application of the mechanism of calculating the impact indicators on the basis of the «best available technologies». The word «technologies» in this case encompasses the technologies in use, and how is the facility designed, built, maintained, used and withdrawn from operation. The term "available" means that the technology has been developed to the extent that it can be implemented in the respective industry in economically acceptable conditions. The technologies are "the best" if they are the most effective ones in reaching the overall level of environmental protection on the whole (TACIS, 2003). Under the conditions when the enterprise faces permanent administrative and public pressure to reduce the level of pollution, this mechanism allows to identify and select really existing economically effective technologies for each of the industries making special harmful impact on the environment. Actually achievable requirements can be identified on the basis of the data collected (Chamber of Commerce and Industry of Russia, 2006).

For achieving this goal, a European Integrated Pollution Prevention and Control Bureau was established within the Commission (European IPPC Bureau) (http://eippcb.jrc.es). Activities of the Bureau are aimed at organizing information exchange in the framework of the Directive. One of the duties of the Bureau is to issue the list of the best available technologies (BAT reference documents - BREFs), which the member states should take into account when identifying the best available technologies on the whole or in specific cases. An entrepreneur has a right to select any technology at his discretion, even the one not in the reference book of BAT; however, in any case he has to observe the requirements fixed by the comprehensive permission.

The Directive requires that the member stated of the EU established a comprehensive system for providing permits that contain specific conditions based on BAT for potentially the most polluting production processes and equipment. Provisions of the Directive are compulsory for all new pieces of equipment and all significant changes of the existing equipment. It is important that the paper is not a dogma and does not establish direct norms. It is an authority basis for agreeing positions of industrial enterprises and establishing a balance – identified in comprehensive permits – between the interests of the enterprises, government and people. One of the most significant consequences of applying this mechanism in EU countries, besides the general decrease of emissions, is the expedited technological development. The enterprises obliged to use additional measures for reducing emissions under the condition of keeping the prime cost at the competitive level have to pay special attention to the development of technologies, increasing their effectiveness and reducing all possible costs.

Upon the results of the analysis of the current Russian legislation in the area of norming and environmental payments one can make a conclusion that the scheme offered by the Directive is the most profitable and

convenient one for adapting under the current circumstances. The proposals to switch to the principles of technological norming have been approved by the Government of the Russian Federation, supported by the key ministries and agencies and have got positive feedback from the business sector. From the point of view of integrating European legislation into the Russian one, the Directive makes basis for comparing the regime of environmental protection adopted in Russia to the respective regime in the EU. We should note that even before passing the Directive in 1996, such complex permits had been introduced in Sweden in 1969, in Denmark in 1972 and in the UK in 1990. The key principles of the above mentioned Directive formed the basis of the Recommendations of the Council of OECD C(90)164 1991 "Comprehensive prevention and control over pollution". Therefore, the mechanism of the Directive is not a novelty and has been tested by the experience of other developed countries.

## Environmental Protection Act, Finland

In the EU countries, the tools of the Directive are working not directly, but they are implemented via national legislation. In Finland it is Environmental Protection Act (EPA) (http://www.finlex.fi/fi/laki/kaannokset/2000/en20000086.pdf). Besides direct implementation of the Directive norms, it introduces and identifies national administrative procedures that can differ from the provisions of the Directive. For instance, the duty to get permits, envisaged by EPA, is stricter than the Directive. Thus, the Directive fixes the requirements for the duty to get comprehensive permits for the types of activities listed in Annex 1. Article 28 EPA requires to obtain permits for any type of activities that has a risk of harming the environment. Art 86 envisages that if there is risk for direct harm or serious pollution and there are no ways preventing it, the supervisory authority can stop the production. A memo on stopping the production should be made, and the entrepreneur has right to protect its interests. The authority should provide the enterprise with the information about the procedures for renewing production. Besides, EPA takes into account that seizure of production does not meat complete stop of pollution. Therefore, ART 90 reads that even if there is no production, the responsible person is liable for preventing the pollution, organizing and running monitoring. If such a person is not available, then the owner of the land becomes responsible.

The key advantage of the law is the outmost information openness and transparency, and any stakeholder has a set of legal tools for expressing and protecting his position. Industrial enterprises, on the one hand, are limited by strict regulations on the basis of NDT and extensive accounting of public opinion and nature protection organizations, and on the other hand, they have extensive rights for protecting their interests and they have a right to work in a predictable legal environment.



## Swedish National Goals

Sweden possibly uses more economic tools than any other country, almost 70 types of them. In 1999, Parliament of Sweden adopted 15 goals for achieving the environmental quality, and economic tools were developed in coherence with them (Table3-1). (http://www.regeringen.se/content/1/c6/06/69/79/80a58d03.pdf). The goals describe the quality and condition of environmental, natural and cultural resources of Sweden, and they are planned to be achieved before 2020. In 2000, the Swedish government formulated 3 main strategies for achieving the environmental quality goals developed and approved in the governmental draft law «Government Bill 2000/01:130» (http://www.iea.org/impagr/CIP/reports/SERT02.PDF).

1. Strategy of more effective use of energy and transport is aimed at reducing emissions in transport and energy sectors with the target to preserve the quality of the air, reduce the impact on climate forming factors, and preserve natural oxidation processes. It includes predominantly energy taxes that have the biggest share from all environmental laws of Sweden, 98% from all environmental tax payments as of 2002 (Söderholm, 2004).

2. Strategy of non-toxic and resource effective cycle systems, including the integrated product system. It implies creation of energy and material efficient cycle systems and reduction of emissions from organic pollutants. Achievement of goals: non-toxic natural environment, zero eutrophication, reduction of climate impact, protection of the ozone layer and well-organized environment (Fedotova, 2006).

3. Strategy of preserving land, water and structure of the environment. It is aimed at solving the problems related to biological diversity, cultural environment, people's health, rational land and water management, environmentally acceptable land use planning and sustainable build-up of the environment. Achievement of goals: "healthy" lakes and rivers, good quality of ground water, balanced sea environment, "healthy" wetlands, sustainable forests, diverse agricultural landscapes, grandiose rock landscapes, and well-organized environment (http://www.regeringen.se/galactica/service=irnews/action=obj_show?c_obj_id=41557).

The table given below summarizes economic tools used in Sweden for achieving the quality of the environment. The tools are distributed in relation to their correlation to a certain goal identified in the Government Bill.

Table 3-1 Economic instruments for environmental protection in Sweden

| Nature conservation goal of environmental quality | Economic tools causing costs (punishment) | Economic tools that give subsidies or reduce costs (incentives) |
|---|---|---|
| 1 | 2 | 3 |
| 1. Reduction of climate impact | Energy tax.<br>Tax on $CO_2$ emissions.<br>Tax increase (higher taxes for energy and use of personal transport).<br>Tax differentiation for $CO_2$ emissions for different means of transport.<br>Road payments and fees for large load capacity vehicles.<br>Rail road fees.<br>Certificates for electricity.<br>Emission trading | Tax differentiation for $CO_2$ emissions for different means of transport.<br>Exemption from the tax on transport working on biogas motor fuel.<br>Program for changing the energy system.<br>Program for investing in local climate.<br>Program of investing in local environmentally sustainable development.<br>Certificates for electricity. |
| 2. Clean air | Payment for parking.<br>Nature conservation classification of gasoline and diesel fuel.<br>Differentiated taxation for gasoline and diesel fuel. | Nature conservation classification of gas and diesel fuel.<br>Differentiated taxation for gasoline and diesel fuel.<br>Subsidizing of public transport.<br>Reduced tax on gasoline with alkylate ingredients. |

| | | |
|---|---|---|
| 3. Only natural oxidation | Tax on sulfur.<br>Fees and taxes for nitrogen oxide | Financing of activities on reducing liming of lakes and rivers.<br>Nature conservation differentiation of fees for sea routes and port areas |
| 4. Non-toxic natural environment | Tax on pesticides.<br>Payments for galvanic elements and batteries.<br>Tax on cadmium in artificial fertilizers.<br>Responsibility of the manufacturer for disposing of car tires.<br>Responsibility of the manufacturer upon the termination of the lifetime of electric and electronic goods. | Differentiated taxation for gasoline (fuel) |
| 5. Ozone layer protection | Payments (penalties) on the basis of nature conservation sanctions | – |
| 6. Radiation environmental safety | Tax on thermal effect from nuclear reactors.<br>Payments for retaining the rights for disposing of specific radioactive wastes.<br>Financing of future costs for using nuclear fuel. | – |
| 7. Zero eutrophication | Tax on nitrogen contents in artificial fertilizers. | Nature conservation grants for activities aimed at reducing nitrogen leaching alkalization and for creating protection zones |
| 8. Good quality of ground water | – | – |
| 9. Balanced sea environment | Payments for water pollution | Grants for removing oil wastes from sea vessels |
| 10. «Healthy» lakes and rivers | Payments on rural areas and fishing | Financing of fishing management |
| 11. «Healthy» wetlands | | Nature conservation grants for creating and managing wetlands in rural areas |
| 12. Sustainable forests | – | Nature conservation grants for investing for increasing environmental value of forests |
| 13. Diversity of agricultural landscapes | – | Nature conservation grants for preserving grazing lands, natural hay grounds, valuable habitats and areas of cultural heritage in agricultural zones, endangered local species, diverse and open agricultural landscapes, organic productiveness, environmentally acceptable cultivation of bean cultures and beetroot. |
| | | Investment grants for enterprises dealing with agricultural gardening and breeding reindeer.<br>Financing for adapting and development in rural areas |
| 14. Grandiose rock landscapes | – | Financing of preventive measures and compensating the harm inflicted to reindeer.<br>Financing of preventive measures and compensating the harm inflicted to other species.<br>Grants for managing conservation of reindeer |

| | | |
|---|---|---|
| 15. Well-organized environment | Tax of natural crashed stone.<br>Tax on storing wastes (waste dumps).<br>Municipal payments for waste removal.<br>Responsibility of manufacturers for recycling packages, paper waste and cars.<br>Payment for cars sent to landfills. | Grants for managing reduction of radiation in private homes.<br>Investment grants for environmental construction.<br>Award for sending cars to a landfill.<br>Deposit (return) systems for containers for drinks (benefits of consumers from the responsibility of manufacturers for packaging).<br>Programs for investing in local climate (Klimp) |

*Source: Swedish Environmental Protection Agency*

As the results of the research show, even those few nature conservation economic tools that at present «live» in Russian economy, do not always work effectively. There are many reasons, but they are to be dealt with as quickly as possible. Foreign experience as a model is not preferable and not always justified. But this experience allows to find the weakest spots in the variety of environmental issues, to group them and to identify initial starting points.

# 4. Problems of ecological damage elimination

## 4.1 Financial activity of the industrial sector

Taking into consideration the economic, political and social peculiarities of Russia, the issue referring to the segment of the Russian society which will be able to become the major driving force of its sustainable development: whether it is the government, non-governmental organizations or the population, is assuming particular significance (WWF, 2007).

The transition of Russia to market economy was accompanied by the large-scale privatization and decrease of industrial production. Basically it referred to the defense establishment and chemical industry (Council of Federation, 2006). As the result, there appeared a considerable amount of ownerless or economically unattractive assets in the 1990-s. The privatization of the ground areas was implemented without taking into account the responsibility of the previous owner for the ecological damage caused by him in the past (FSETAC, 2008). This fact can become a serious obstacle for home and foreign investors, as there is a potentiality of making new owners responsible for restoring the environmental balance distorted by the previous proprietors.

The territories locating abandoned industrial units are characterized by a high level of danger for the health of the population and are in a critical ecological condition. The territories which are situated within the boundaries of the centers of population and industrial sites influence the social sphere most considerably because they directly affect the health of over 60 million people (FSETAC, 2008). According to the official statistics 40 million citizens of the country live in unfavorable ecological conditions, while 1 million – in conditions of a dangerous level of pollution. According to the data of the committee chairman of the State Duma dealing with natural resources, nature management and ecology Natalia Komarova, 2,5 million sq. km. are recognized to be ecologically unfavorable in Russia, which is approximately 15% of the territory of the country (http://www.ng.ru/economics/2008-08-07/4_ecology.html). This is more than the territory of England, France, Germany, Norway, Sweden and Finland taken together.

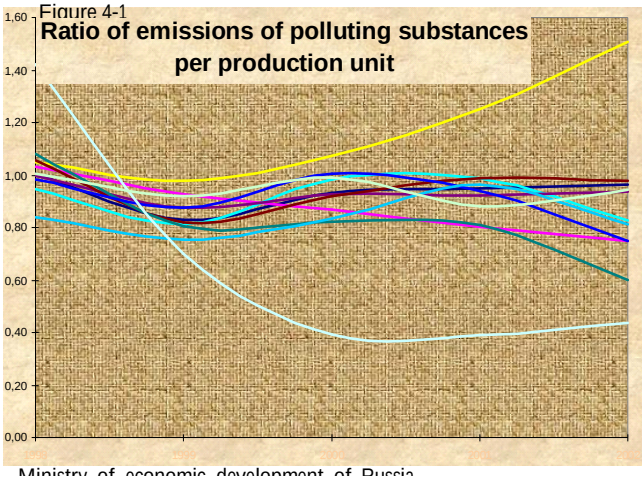
Within the research conducted in 2005-2006 by the World Bank there was approximately assessed the scale of the negative effect of the objects of the past ecological damage to the ecosystems and health of the population of Russia. According to the preliminary assessment the overall value of work for cleaning and restoration of territories can amount to dozens of billion $US (FSETAC, 2008). The international experience proves that financing a full complex of measures targeting the elimination of the ecological damage requires a considerable amount of private and government investments (Russian Academy of Sciences, 2007).

The effective solution of any problem of this scale depends on the degree to which the major participants are interested in it. In our case, it is the Government of the Russian Federation which is responsible for administering the protection of the environment as well as the representatives of the business sector which are interested in following the regulations with the least losses. The goal of the present paper is to formulate a concept of a possible strategy of reforming the legislation in the area of economic motivation of business. To achieve the aforementioned task, first it is necessary to analyze to which extent the representatives of the private sector are willing to invest their money into environmental protection. It is important to understand whether the industrial companies are ready to carry out nature conservation measures independently or they need the support of government authorities. The effectiveness indicator of realization of legal norms in the

realm of environmental protection can be the activity of the industrial sector in the implementation of ecological measures or the amount of their expenses on the environmental conditions. In what follows we will consider the role of environmental protection in the budget policy of industrial enterprises.

Figure 4-1 illustrates the dynamics of polluting substances emissions per production unit in different sectors of economy over the last ten years. As it can be seen from the presented data, the majority of industrial complexes equally affect the environment. An exception is the fuel industry, the ratio of emissions of which has increased to a considerable extent over the last few years. The ratio of emissions from the light industry is substantially low. This can be related to the closure of the enterprises of light industry and the minimization of production.

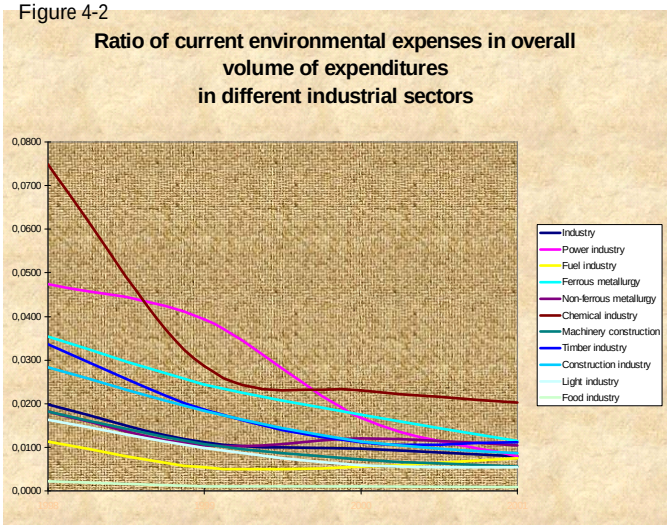
Figure 4-1




Ministry of economic development of Russia

Figure 4-2 presents the ratio of the environmental expenses of the same sectors of economy for nature conservation measures with respect to the overall volume of expenditures of the enterprises. It is evident, particularly by the example of the fuel industry that the level of expenditures directed to the rehabilitation and protection of the environment is considerably lower than the level of emissions.

Figure 4-2




Ministry of economic development of Russia, 2009

Nevertheless, it should be mentioned that in accordance with the data of the Russian Academy of Sciences the volume of the nature conservation investments of the industrial complex in the overall volume of investments is quite substantial (Russian Academy of Sciences, 2007). The role of the regions should not be underestimated either.

Over the last few decades the constituent territories of the Russian Federation practically did not receive any investments into the environmental protection, organization of natural resources conservation or elimination of the ecological damage from the federal budget (pers. comm. Soldatkin). At the same time, the absence of legal, organizational, and financial framework at the federal level, the objective of which would be solving this problem results in shifting by default the responsibility for the ecological damage onto the municipal institutions (FSETAC, 2008). It is obvious that the local authorities are not prepared to solve these complicated issues neither from organizational nor from financial points of view.

Unfortunately, it should be recognized that researches in the field of investment activity of the Russian companies are not high-priority. The latest data prepared by the Federal Service of State Statistics for the Russian Academy of Sciences dates back to 2006 (State report). Table 4-1 presents the structure of the nature conservation investments referring to the major types of economic

activity covering 2005-2006 which come from the federal, regional and local budgets as well as the enterprises' own funds.

Table 4-1 Investments in environmental protection in different sectors

| Major types of economic activity | Federal Budget | | Budgets of the constituent territories of the Federation and local budgets | | Enterprises' own funds | |
|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 |
| Agriculture, hunting and forestry | 51,7 | 88,9 | 31,3 | 2 | 16,8 | 9 |
| Mining operations | 0,1 | - | 0,1 | 0,01 | 97,6 | 95,5 |
| Manufacturing activity | 0,1 | 1,2 | 0,9 | 1 | 98,9 | 97,3 |
| Production and distribution of electric power, natural gas and water | 1,2 | 4,9 | 19,8 | 40,2 | 77,6 | 54,7 |
| Transport and communication | 9,2 | 11,4 | 4,3 | 1,4 | 79,9 | 84,5 |

*Source: Sate report "Referring to the state and protection of the environment of the Russian Federation", Ministry of Natural Resources of Russia, 2005, 2006*

As it can be seen from the aforementioned data, the biggest contribution to the investments make up the own funds of the enterprises which are immediate sources of environmental pollution. Such fields of economy as manufacturing industry and mining for minerals practically completely invest into natural conservation activity. The transport sector and communications, the sectors of production and distribution of electric power, natural gas and water invest over two thirds. It is remarkable that the least expenditures are supported by the Federal budget and these are generally directed towards the ecologic activities in agriculture and forestry. On the whole, according to the data of the Russian Academy of Sciences by 2006 the volume of nature conservation investments has increased in all sectors (RAS, 2007). Inter alia it conditions the stabilization of the level of the ambient air pollution and the decrease of pressure on the water bodies (Ministry of Natural Resources, 2006). Nevertheless, there should be singled out some peculiarities of the dynamics of pollution growth and investment activity. For instance, compared to 2005 the production growth amounted to 3,9%, emissions into the atmosphere increased by 0,8% (MNR, 2006), whereas the volume of the nature conservation investments increased by 16% (RAS, 2007). That is, insignificant modifications of the volumes of emissions into the environment in 2006 required a quite substantial volume of investments in nature conservation activity.

In 2007 World Wild Fund Russia published a report, the goal of which was to analyze the degree of ecological and social responsibility of 315 leading companies of Russia (WWF, 2007). This survey, analyzing the approaches of the Russian companies towards the issues of sustainable development and environmental protection, is the first project of this type conducted in Russia. The role of the Russian business in securing sustainable development had not been studied profoundly enough before that, consequently this project is of great scientific and practical importance.

One of the questions of the questionnaire referred to a concrete budget at the enterprise specifically for the nature conservation activity. These budgets ranged from $33,000 per year at a producer of pipeline fitting to

$233 million per year at a natural gas company. In some cases the respondents presented data as to their ecological expenditures as percentage of the overall budget, for instance 8% of the overall investments into the project of a company building oil and gas facilities (WWF, 2007). According to the data of Gasprom the investments into the environmental protection of the company in 2008 amounted to almost 2,5 billion rubles (appr. 57 million euro) which is an 80% growth compared to the previous year. One of the stimulating factors is the attention from the foreign investors who invest into the shares of Gasprom. For instance, a questionnaire of the London stock exchange contains questions referring to the activity of the company in the area of environmental protection (pers.comm.Romanov). It should be also mentioned that Gasprom is one of the first companies in Russia which has adopted its Ecological Policy in 1995 (Gasprom, 2007).

On the whole many companies view nature conservation measures as a method of reducing expenses and increasing competitiveness and effectiveness both within the country and abroad. The overwhelming majority of the survey participants (93%) consider that the Russian government should stimulate investments and support the companies which export ecologically clean production and services. The WWF of Russia considers that the results of this survey confirm the general ecological awareness of the Russian companies and their desire to protect the environment and carry out ecologically responsible industrial activity.

## 4.2 Legal rationale

In the present paper the ecological damage is defined as "the actual ecological, economic or social losses which appeared as the result of violating the legislation, economic activity of the society, force majeure ecological activity and natural calamities" (RAS, 2006). Generally the causes of past, present and future ecological damage in Russia are related to the industrial activity of enterprises of different branches of economy. In the "State report about the condition and protection of the environment" (MNR, 2005) there were named the following direct sources of ecological damage: transboundary pollution, oil pollution, chemical pollution, radioactive contamination of the land and sea, high resource-intensity, low efficiency of raw material usage, solid wastes, degradation of ecosystems, emergency-related escapes and emissions, destruction of the coastline, social and economic problems of the native population, threat to the biodiversity. Most of the aforementioned risks are in this or that way connected to industrial enterprises activity.

The source of proper ecological law of Russia and the right for ecological security and protection from the ecological damage is the Constitution of the Russian Federation (1993). The key notions of the ecological law and the right for ecological security are the fundamentals of life, environment, nature, ecology, ecological development, natural resources, nature management [1]. Most of these regulations are reflected in the Federal legislation. However, since passing the Constitution of Russia till the present moment a range of provisions of the constitution is still unsupported, among them are the issues of encouraging activities favoring ecological welfare (article 41, Constitution of the Russian Federation, 1993).

The main document regulating the procedure of assessment and determining the extent of ecological damage can be considered the Civil Code of Russia (1994), which establishes the general principles of damage

[1] It is important to note, that nature management, direct negative impact upon the environment, are also protected by the constitutional rights of the citizens, as it directly refers to the right for carrying out economic activity.

assessment and indemnification. The Civil Code stipulates complete indemnification of the life and property of natural and legal persons. Paragraph 2 of article 15 discloses the notion of real damage. It should be emphasized that the real damage includes not only expenses actually born by a corresponding person, but also the expenses which this person will have to bear to restore the violated right. In our case it is not only the elimination of the actual pollution but also elimination of the consequences of the past ecological damage.

The Federal law "Referring to the environmental protection" (2002) is the fundamental document of the Russian Federation in this area. The law establishes the main principles of conduct and the responsibility of the nature managers. There are no direct references to the ecological damage in this document, but the main principles of the law deal with these problems. So, article 3 establishes the presumption of ecological danger by the planned economical or other type of activity, as well as the payment basis of the nature management and environment indemnification. The necessity to implement the measures directed towards the elimination of the ecological damage is supported by the Program of Social and Economic Development of Russia for the middle-term outlook (2006-2008). The creation of economic instruments and mechanisms for the elimination of the damage caused to the environment and compensation of losses were among other "most important objectives of the state ecological policy".

As a result of a well-established practice of nature management, the ecological legislation currently in force does not contain any regulations referring to economic motivation of ecological risk decrease. One of the reasons might be the absence of real understanding of the nature of ecological risk and its significance. The Federal law "Referring to the environmental protection" proposes the following definition: "Ecological risk is the probability of any event which has unfavorable consequences for the environment and is caused by the negative effect of economic or other kind of activity, emergencies of natural or anthropogenic type" (Federal law, 2002). The present definition gives emphasis to the probably characteristics of ecological risks. The legislator did not take into consideration the economic component of unfavorable consequences for the environment. Consequently the ecological risk can not be regulated through economic methods.

The Russian Academy of Sciences defines ecological risk as a quantitative characteristic of ecological danger, calculated with regard for the economic losses which are being inflicted (RAS, 2007). Such definition not only takes into consideration the probability of a constant, and not situational, influence upon the ecosystems, but also allows for the economic losses resulting from it which are caused by both the state and nature managers. To understand this mechanism the scientists of the Academy of Sciences propose to differentiate between the direct and indirect damages. The direct economic damage is connected with the deterioration or losses of the production funds, as well as the influence on the population and the environment. The indirect damage includes the losses supported outside the area of direct negative influence. For instance, the losses of electricity due to the destruction of a big power station lead to the production output decrease in other sectors of the economy. Following the definition of ecological risk, proposed by the RAS there can be formed economic instruments which are based on the agreement of the parties. In this case the problem of the environmental protection will be solved through achieving balance between the economic objectives of the nature manager and the state which is interested in securing a favorable environment.

Summarizing the aforementioned, we can make the conclusion that at the present moment there has appeared a number of organizational and legal gaps in the area of defining and eliminating ecological damage. They include:

- the notion of ecological damage has not been defined;

- there are no legal grounds for determining and transferring the responsibility of the parties for the elimination of ecological damage (RAS, 2007);

- the legislation of the Russian Federation does not regulate the questions of compensating the responsibility for the ecological damage which has been caused as the result of the past economic activity (pers.comm. Gavrilov);

- there have not been established the mechanisms of financing the corresponding measures as to the elimination of ecological damage (pers.comm. Gavrilov);

- the existing instructive and methodological documents of the federal level do not always allow to receive concrete assessment of ecological damage, as they do not take into consideration the regional peculiarities of the territories (pers.comm. Zhukov);

- there are no economic mechanisms to reduce resource-intensity and increase the energy effectiveness of the economic activity nor incentives to reduce ecological damage;

- there are no incentives to locate new productions in the regions with intensive economic and industrial development (RAS, 2007)[2];

- the mechanisms of economic regulation, including the payment for excessive negative effect, do not secure due influence on the nature conservation requirements violators (МЭРТ, 2006);

- there are no incentives for the implementation of advanced practices of exploitation, alternative and energy-saving technologies (pers.comm. Gavrilov);

- the existing ecological and economic instruments of regulation of the nature management and environmental pollution are not effective (pers. comm. Gavrilov).

Besides, it is necessary to single out the low level of information technologies development in the area of ecology. Trustworthy information about the condition of the environment, separate natural complexes, the effect of economic and other activities on the environment is a fundamental indicator of development in any domain. Unfortunately, the contemporary state of the ecological monitoring system does not allow to receive such trustworthy assessment (RAS, 2007). There is no up-to-date and systematic information about the sources of ecological losses, the level of pollution of the territories and the scale of past/accumulated ecological damage (FSETAC, 2008). "A poorly developed institutional framework may affect the ability of authorities to monitor environmental degradation and/or pollution and, in turn, retard the development of effective environmental policies" (Asafu-Adjaye, 2000). That is, it is impossible to guarantee the reliability of information, offered by the official state authorities. Such information cannot serve as the grounds for comparative assessment and at the same time conditions taking deliberately wrong decisions. This question is not the topic of the present investigation but it would be probably reasonable to involve the private sector in the solution of this issue. The condition of the environment is directly related to the economic activity of

[2] This statement can be doubted. Regions with intensive "economic and industrial development" inevitably face the necessity for eliminating the past and present ecological damage. The placement of new production can deteriorate the ecological situation of these territories.

enterprises. Consequently, the representatives of the business sector can be interested in the development and modernization of the system of ecological monitoring.

## 4.3 Economic instruments as a possible solution

With the purpose of solving the problem of ecological damage elimination, it is necessary to elaborate a complex of measures as to its step-by-step solution and creation of the corresponding legal and investment mechanisms. Thereupon, the Federal Service of Ecological Surveillance, which is a body of control and surveillance in the sphere of limiting the negative anthropogenic impact, elaborated the concept of the project "Elimination of the past ecological damage in the Russian Federation". The goal of this project is the elaboration of regulatory, institutional, innovative, financial and investment mechanisms of the step-by-step solution of the accumulated ecological damage in Russia (FSETAC, 2007).

Within this project it is suggested to elaborate and implement a complex of measures in several main directions, including:

1. implementation of innovation technologies of the accumulated wastes removal and rehabilitation of the territories, polluted as the result of economic activity;
2. preparation of projects of regulatory documents, directed towards stimulating the modernization of industrial production through the implementation of low-waste and power efficient technologies;
3. selection and approval of financial and investment mechanisms of the elimination of ecological damage related to the economic activity;
4. development of forms and mechanisms of state-private partnerships with the view of solving nature conservation assignments.

At present the project is being agreed upon with the concerned ministries and institutions.

No doubt, the mere fact of presentation of such a project by the federal authority is the proof of the willingness of the government bodies to search for the solutions of the problem of environmental damages. At the same time, the due and complete solution of the given problem is a long-term process, which requires the elaboration of a system approach and the implementation of a complex of practical actions requiring substantial financing.

Potential models of financial mechanisms exist in the international practice, where there are examples of creating funds of long-term state financing, state-private partnerships, special domains funds financed at the expense of the contributions of industrial enterprises as well as guarantee instruments of financial organizations (RAS, 2007). There are no such instruments in the current legislation of the Russian Federation. Thus, one of the most important tasks is the search of mechanisms which would secure the necessary financial basis for the implementation of actions as to the prevention, elimination and compensation of the ecological damage by the economic agents.

The economic mechanisms in the area of environment protection, based on the mutually beneficial private-state collaboration, can become such instruments. The stimulating economic instruments can not only reduce the volume of the present ecological damage but also favor the elimination of the past one. Besides, such instruments can and must make the nature conservation of the enterprise profitable, as viewed from the angle of distribution of the company profits. With the purpose of solving the problem of ecological damage and optimization of the interaction between the state and business, it is necessary to form a system of actions

of economic stimulation of environmental protection and effective nature management. Such system should include mechanisms of economic influence stimulating the development of ecologically balanced production and technologies. The market instruments (investment but not the legal ones) have the leading role in such mechanism of nature management regulation. They will contribute to the production growth based on new technologies, will reduce the ecological expenses of the enterprises, will allow to increase the efficiency of the nature resources usage. However, from the point of view of the experts (RAS, 2007) such system is extremely costly.

To counterbalance the system of stimulating mechanisms in which the business has a certain degree of freedom by taking decisions, there is a scenario completely corresponding to the characteristics of the command and control approach. According to this scenario the legal, administrative and market instruments of state regulations are used to limit the economic agents' activity. Through tough tax, credit and penal policies the development of certain areas can be suppressed with the purpose of ecologization of the production process. This scenario can be supported by many experts since "it is widely accepted among economists that incentive-based (IB) regulations generally provide lower average and marginal abatement costs than command and control (CAC) type regulations" (Sterner, 1999). On the whole such approach can facilitate saving natural resources and diminishing ecological damage. However it is evident that such scenario will considerably limit the activities of companies and their freedom of taking decisions referring to the disposal of the funds of the enterprises.

Practically the aforementioned scenarios can be used in their combinations. Historically "the stick and carrot policy" functions in Russia best of all. "Its aim was to provide a system of incentives to follow the principal's instructions with regard to production. Those incentives … consisted of the proverbial carrot and stick" (Yavlinsky, 2000). In our case it means that, on the one hand, special attention should be paid to a solid legislative basis. Legal provisions should have the possibility of direct and significant administrative influence. On the other hand, stimulating economic instruments should be applied. It would be reasonable to have a complex of measures, both economic and financial, which would be accessible for enterprises from the point of view of their application in any industrial sector.

Taking into consideration the aforementioned, we can make the conclusion that at present there is a favorable atmosphere for reforming the legislation in the area of economic regulation of environmental protection. On the one hand, the federal authorities acknowledge the importance of establishing strong and lasting contacts between the state and business with the purpose of implementation of nature conservation programs. On the other hand, representatives of private companies are aware of the necessity of activization of nature conservation activities in order to create an image of the company on the international market.

# 5. System of environmental standards

## 5.1 Legal support to environmental standardization

In order to form the concept of necessary changes in legislation in the area of economic regulation of environmental protection it is necessary to understand the basic principles of identifying the responsibility of nature users. In Russian environmental legislation, standardization (norming) of environmental quality, emissions, discharges and disposing of wastes is such a base. The basis for ensuring environmental quality consists of the current extensive system of maximum admissible and temporarily approved emissions and discharges of pollutants into the environment. Emissions and discharges are regulated as maximum admissible values at the end of the pipe.

Standardization of the acceptable exposure on environment is used in order to prevent a negative impact on environment while executing economic or another activity, and it must ensure keeping the standards of environment quality. Currently the procedures of elaboration, substantiation, submission and ratification of the indicated standards are established and used in practice. These procedures apply to legal persons and private entrepreneurs during whose economic or another activity environment is negatively influenced.

Along with application of the above mentioned methodical approach to the regulatory actions of environmental impact a new ecological and economic mechanism was launched since the beginning of 1990's (MNR, 2008). It foresaw payment for standard and above norm environmental pollution and had a compensatory and motivating nature. The compensatory nature is incidental to indemnification caused by flux of polluting substances into environment beyond the industrial territory of enterprises, and the motivating nature is incidental to application of multiplying factors to rates / bids, the possibility to offset payments towards execution of environmental protection activities, focused usage of means of payment that came into non-budgetary ecological funds. The goal of this ecological and economic mechanism was to reduce the amount of emissions, dumping and allocated waste gradually (in proportion to construction of treatment plants, implementation of new technologies and production) (MNR, 2008).

Norming in the area of environmental protection in Russia is regulated by several statutory acts. First of all, the basics for norming and requirements to developing the norms in the area of environmental protection are identified by Chapter V of the Federal Law on Environmental protection (2002). Article 22 of the law envisages the following norms of admissible environmental impact:

- norms of admissible emissions and discharges of substances and microorganisms;
- norms of creating production and consumption wastes and permits for their disposal;
- norms of admissible physical impacts (amount of heat, levels of noise, vibration, ionizing radiation, intensity of electromagnetic fields and other physical impacts);
- norms of admissible withdrawal of environmental components;
- norms of admissible human impact on the environment.

Emissions and discharges of chemical substances, including radioactive ones, other substances and microorganisms into the environment within the limits established by the norms of admissible emissions and discharges of substances and microorganisms, permits for emissions and discharges are allowed on the basis

of permits issued by the executive authorities that realize governmental management in the area of environmental protection.

Another important part of admissible environmental impact standardization is concerned with elaboration and certification of standards of admissible anthropogenous load on environment that are established on the basis of each cumulative (from all sources) type of environmental impact within particular territories (water areas). Major types of negative environmental impact include: emissions and dumping of polluting substances, sub-soil and soil pollution, emplacing of production and consumption waste. Standards of admissible anthropogenous load on environment include maximum allowable (critical) loads on ecological systems and water bodies admissible impact standards. Standards of maximum allowable (critical) loads on ecological systems, first of all on ambient air and geological substances (soil, waters, vegetation mantle) are not currently elaborated and applied.

The statute by the Government of the Russian Federation established the norms for paying for air emissions from permanent and movable sources (210 substances), discharges of pollutants into surface and ground water (420 substances) and disposing of production and consumption wastes (Governmental Decree, 2003). The statute of the Government of the Russian Federation (Governmental Decree, 1992) establishes procedures for identifying the payment and its limits, i.e. the key principles of calculations of the amount charged. Also the document identifies the federal executive authority responsible for the administration. We should note that this statutory act establishes exactly the rates of the payments for environmental pollution. Procedures for calculating the norms of admissible impact are identified by other statutes of the Government and separately from each branch of industry: air, wastes, or water resources.

## Waste

Standardization of admissible impact by waste handling is executed according to the Rules of Elaboration and Certification of Waste Formation and Limits on Its Placing Standards ratified by the Decree of the Russian Federation Government on Rules of Elaboration and Certification of Waste Formation and Limits on Its Placing Standards, as well as methodological guidance on projects on waste formation and limits on its placing standards elaboration. This guidance was ratified by the Order of the Russian Federal Service of Environmental, Technological and Nuclear Supervision (Rostechnadzor). For calculating the payment for the negative impact from dumping production and consumption wastes, the wastes are split into 5 categories on the grounds of their environmental hazard.

Owing to absence of ecologically sage waste disposal / management infrastructure the system of limits (standards, in fact) on waste allocation was put into practice in the beginning of 1990's. Setting limits on waste emplacement (in fact standards) foresees elaboration of materials by managing subjects that lead an economic or other activity during which waste is formed. Such materials include estimation of the planned waste quantity for the upcoming period, suggest procedures/measures on its ecologically safe removal through using, deactivating (burning) and emplacing with an indication of the waste quantity that will be sent to storage and ground disposal. Herewith a managing subject should vouch real waste removal in an ecologically safe way once a year.

## Ambient Air

Standardization of the acceptable exposure is executed according to the Provision on Standards of Harmful (Polluting) Substances Emissions into Ambient Air and Harmful Physical Impact on It ratified by the Decree of the Russian Federation Government. Setting the standards of admissible emission foresees execution of stock taking of all emissions and emanation sources, elaboration of projects on total emissions (from all the sources) projects standards, and preparation of the materials that justify/ground non-exceeding of ambient air standards quality on the edge of the buffer area / sanitary-hygienic zone around the industrial territory (taking into account financial state and emission input by other enterprises) at the maximum productivity of an enterprise and the most unfavorable synoptic conditions.

It is interesting to note that harmful physical impacts on the air that make a negative influence on peoples health is not the subject to this statutory act. Thus, it is implied that there are some substances that make harmful impact on the air but do not related to the rest of environmental components. Therefore, one can make a conclusion that the law-drafter rejects the ecosystem approach as the basic environmental theory.

## Water

Standardization of the acceptable exposure is executed according to the Decree of Government of the Russian Federation on the Approval Order of Acceptable Waste and Microorganisms Dumping to Water Bodies for Water Users, as well as the methodology of elaboration of acceptable waste and microorganisms dumping to water bodies for water users standards (Governmental Decree, 2007).

Establishment of affordable dumping standards foresees economic agents (water users) elaborate projects to elaboration of standards for each emission of sewage and substances. Such standards prove that non-exceeding water quality standards of a water body in control points with a maximum production capacity of an enterprise and under the moist unfavorable hydrologic conditions. The control points are situated as follows: at a distance of 500-1000 m higher the closest water consumption point according to the current (depends on end use of a water body) for flowing water reservoirs; in a sector within a radius of 500 m from the disposal point or within a radius of 1000 m from the closest water consumption point for stagnant basins (depends on end use of a water body).

The cumulative dumping of all substances by all water users into a water body must not exceed the standard of admissible influence on this water body. The standard takes into consideration the input from all dumping sources, diffusive pollution, external gain, baseline state etc. In case model calculations of polluting substance diffuse (dilution) that were made at the development of materials of justification of standards projects demonstrate that concentration of the polluting substance at an external border of sanitary-hygienic zone/buffer area (in a control point) exceeds its standardized value, the managing subject may be set the limits on emission (limits on dumping). The condition here is that a nature protection activities program is elaborated and coordinated. The program foresees to achieve admissible emission standards (admissible dumping standards) in a set time frame step-by-step.

Admissible impact on water bodies standardization is executed in accordance with the Order of Admissible Water Bodies Impact Standards Approval as well as methodological guidance on elaboration of admissible water bodies impact standards ratified by the Order of Ministry of Natural Resources of Russia. The standards of admissible impact (with regards to substances inflow) for a water body or its part are set based on its purpose, and they are used by certification of admissible dumping standards as a measure of admissible

cumulative load (cumulative dumping of polluting substances per time unit) from all the sources situated within a river drainage or its part on a water body or a part of it. Currently the standards of admissible impact for particular water bodies (their parts) are in development stage (MNR, 2008).

## 5.2 Disadvantages of the system

In accordance with the expert opinion of the specialists directly dealing with practical implementation of those statutory acts, some deficiencies of the existing norming system were identified (pers. comm. Gavrilov, Zhukov, Pluzhnikov).

First of all, norms are calculated within the limits if admissible impact, i.e. the payment is taken from conventionally law-abiding economic agents. This mechanism is based on a principle, which envisages the ability of the environment to assimilate a certain level of pollution. One should note that environmental legislation of industrially developed countries considers exceeding the impact to be a violation of law. Such a violation is subject to administrative fee and envisages compensation of damage to the environment and third persons under the claims, if the violation resulted in damages of the third persons or inflicted a proved damage to the environment (Ministry of economic development of Russia, 2005). Besides, the amount of fees is identified on the grounds of the territorial principle (increasing coefficients). As a result, companies pay different sums of money for the same violations regardless of their hazard for the environment and depending on their location.

In the opinion of the Minister of Natural Resources of Russia Juriy Trutnev, the existing norming system does not fulfill the function of motivating to create clean production and introduction of up-to-date technologies of waste and air emission treatment due to extremely low payments. "Besides, due to vagueness of the legislation, and, therefore, subjectivity of decision-making by clerks, the norming system has a big corruption potential", highlighted the minister. (http://www.prime-tass.ru/news/show.asp?id=816170&ct=news). Current Russian norms for emissions and discharges are strict. They are practically unachievable with the help of European BAT principles. In practice, temporary permits slightly motivate people for environmental improvements. It means that on the whole the system of environmental standards does not reach the goal of gradual pollution reduction.

A number of enterprises failed to keep even such elastic values of emissions and dumping that can be considered standards only conditionally. In this respect so-called temporary consensual emissions and dumping (limits of emissions and dumping) were established for the enterprises for the period of nature protective activities and reaching the standard values. In practice this procedure is repeated multiple times due to incapability to reach the standards within the planned timeline. Temporary permits for emissions and discharges are often prolonged every year, despite the fact that no improvements are made during the previous year. (TACIS, 2003). Thus, lower norms become the actual standard. Maximum admissible emissions and discharges of pollutants is aimed at collection of payments but not at improving the environment.

## 5.3 Possible scenarios for improvement

One of the possible scenarios of environment quality standardization system improvement foresees differentiation of requirements to the operating and new enterprises. With regards to the operating enterprises they propose to exclude gradually from practical activity setting limits for emissions and dumping by means of the economic motivation methods (MNR, 2008). Standardization of such enterprises (before they are closed or reconstructed) will be executed according to the existing procedure. With regards to the new (or those that are under reconstruction) enterprises they propose to toughen the requirements to the standards of the allowed emissions and dumping by setting the limits on the concentration of polluting substances (contaminants) at the level of indicators that correspond to the technological emission norms (standards) for the best available technologies. At the same time the limits on new enterprises placement can be exercised in case when it is impossible to adhere to the standards of maximum permissible (critical) load on the ecological systems.

Besides, it was proposed by the State Duma and Ministry of Economy of Russia to exclude legal regulations on the necessity to set the waste formation standards and limits on their placing as applied to industries that act within waste management from the legislation of the Russian Federation on waste management (MEDT, 2006). An economic agent, enterprise, is entrusted with taking a decision on the way to remove the waste. This decision is taken company to minimization of expenses on the removal procedure, but on condition that ecological safety requirements with regards to non-exceeding admissible emissions (disposal) of polluting substances, as well as durable/reliable isolation of emplaced waste will be kept absolutely (MNR, 2008). State regulation of this activity (e.g., in terms of waste quantity reduction that is directed at placing) can be executed by using the economic motivation methods, such as fee rates for waste emplacement and their multipliers.

The key feature of such an approach is that the goal of the system is not payment calculation and collection but identification of actually achievable limitations of harmful impact on the environment for planning and implementation of respective nature conservation activities. Nature users choose not the norming system but the technologies for reducing negative impact. As Vice President of "Nornickel" resource company V.Engelsberg noted in his interview in newspaper "Vedomosti", increase of payments has sense when more advanced technologies for reducing environmental impacts are available (Vedomosti, 2008), i.e. a mechanism is required which is aimed at continuous enhancement but not at formal observance of norms and rules.

Table 5-1

**Russian Greenhouse Gas Emission Projections**

| The lower number represents the probable scenario, the higher number represents a high-growth scenario.<br><br>Index: 1990=100[a] | | |
|---|---|---|
| | **2000** | **2010** |
| Carbon dioxide | 75/78 | 81/90 |
| Methane | 75/80 | 63/69 |

*Source: Russian Hydrometeorology and Environmental Monitoring Service*

The increase of the fee for oil gas emissions (methane) can be a vivid example. In accordance with the Kyoto Protokol which came to force in 2005, the Russian Federation took the responsibility for limiting greenhouse gas emissions. Methane is the second greenhouse gas in terms of climate impact. In the Russian Federation, the share of methane makes 15% of all human emissions (Ministry of economic development, 2005). According to the Third national

communication of the Russian Federation (http://unfccc.int/resource/docs/natc/rusnce3.pdf); over 65% of the total volume of emitted methane originate from the energy sector. The most significant share of those emissions are concentrated in oil industry. The most difficult situation is connected with flaring oil gas. According to the information of the Ministry of Nature of the RF published in press. In 2005-2006, about 55-60 billion cbm of natural gas were extracted in Russia, and about 26% of them (about 15 billion cbm) were flared (http://www.ng.ru/energy/2009-04-14/9_optimize.html).

All areas of intensive oil and gas extraction feature aggravation of the environment, especially due to air harmful emissions. Flaring of the oil gas results in significant economic losses. According to the estimates of the Energy Strategy Institute, burning of 1 billion of oil gas is the equivalent to the loss of mass of commodities 270 million USD worth (http://www.energystrategy.ru). After the ratification of the Kyoto Protocol by Russia, flaring of the oil gas leads to additional losses in the amount of 3 to 5 billion USD due to the reduction of the sales of the established number of emission reduction units and possible limitations for greenhouse gas emissions.

The measures taken by the Government of Russia on creating economic stimuli for disposing of the oil gas turn out to be insufficient. The solution of just increasing the price for that product brought no desires effect. At the beginning of 2002, the limit for the price for the oil gas rose from 55 to 150 RUR for 1000 cbm. Later the limit was raised to 350 RUR with the minimum value of 275 RUR. Therefore, the price for the oil gas rose almost by 7 times during the year, what made almost no changes in disposal of that gas. (Ministry of economic development, 2005). In 2005, the Government of Russia introduced amendments to the Statute of the Government No. 344, which establishes the norm for the payment for environmental pollution. This statute significantly increases payment rates for methane. However, that measure did not lead to the desired effect. In the opinion of the ecologists of Gasprom company, at present, pollution of the air with toxic products of natural gas flaring takes place under the slogan of "environmental" requirements and becomes more economically profitable than blowing the environmentally safer methane into the atmosphere (pers.comm. Romanov). OAO Gasprom believes it to be feasible to bring back the norms for methane emissions, that were valid till July 2005.

According to the data of Rostekhnadzor, in 2006 about 87% of pollutants (weight) were emitted into the air or discharged into water bodies with the norms, about 11% of pollutants (weight) were emitted into the air or discharged into water bodies within temporary permits and only 1-2% of pollutants (weight) were emitted into the air or discharged into water bodies above the established limits. At the same time, the payment for emitting 87% of pollutants within the norms was collected under significantly lower rates (FSETAC, 2006). That means that the norming and economic regulation systems existing in the Russian Federation were mainly targeted on regulation within the norms. For justifying 1-2% of emissions in the category "over-limit pollution" the companies spent considerable resources.

All this shows ineffectiveness of the whole system of norming and reflects the fact that due to the lack of clear criteria for attributing impacts to different criteria, they are – most probably – were identified on the basis of subjective opinion of clerks. This fact reflects corruption inconsistency of the whole regulation system, which includes the system of norming and economic regulation. The only one way out of the situation can be to build a new system of norming and economic regulation. It is possible to present the key parameters of the norming system aimed at the best available technologies.

Besides necessary administrative regulation, implementation of the BAT system should be supported by stimulating economic tools. Those can be payments, subsidies or permits. In the context of the Russian Federation, the system of environmental payments and fees can ensure integration of the BAT mechanism in two ways. First, environmental payments as such are incentives for emission reduction. Reduction of emissions leads to the reduction of payments by industries. In practice that can mean the increase of the existing rates of payments and fees, what will not be an additional administrative barrier when innovation technologies are used. On the other hand, as the experience of other countries shows, for instance Poland, environmental funds play a significant role in financing environmental investments (http://www.kul.lublin.pl/kos/techne/pl_1.pdf).

Therefore, the key economic tool in Russia might remain payment for the negative environmental impact. Environmental payments will be effective, if the rates are rather high. Then the mechanism of the payment will become an economic incentive for changing the structure of production in order to reduce pollution. Besides, it is necessary to create conditions for partly financing of environmental investments of industries from other financial sources, for instance, environmental funds.

# 6. Economic mechanisms in the area of environmental protection in Russia

From the mid 1980s, the development and implementation of economic tools (including some market ones) started in the area of environmental protection, which were intended for encouraging resource saving, reduction of pollution and wastes, and improvement of natural ecosystems. According to the estimations of foreign experts, proved by the actual practice, a new generation of environmental and resource policy is being formed (Pakhomova, 2005). The following tools might be listed.

First of all, those are economic tools that have been tested at the international level and updated recently: environmental taxes, emissions fees, financial incentives for environmental activities, fees and taxes for the use of primary (natural) and secondary (processed) resources. Nowadays, environmental and nature protection taxes are becoming dominant (Fedotova, 2006).

Secondly, "purely" market mechanisms are becoming more attractive, i.e. market negotiations procedures, for instance, on compensating environmental damage to people, sales and purchase of rights for greenhouse gas emissions. Voluntary environmental agreements also belong here: business to business, government to business, and business to NGOs. Those mechanisms are intermediary mechanisms and a sort of indicators of the openness of the government for cooperation with non-governmental sector.

Thirdly, purely governmental mechanisms might be identified based on governmental funding. Those are federal and regional programs for solving the most complicated issues in the area of environmental protection. This block might also incorporate provision of financial subsidies in the format of direct grants and loans with discounted interest rate.

Fourthly, mechanisms can be listed that belong to benign forms of environmental regulations (Fedotova, 2006), namely ISO 14001 certification, voluntary introduction of environmental management at an enterprise, enhancement of responsibilities of manufacturers for their impact on the environment.

In accordance with the current legislation of the Russian Federation, economic mechanisms of environmental protection include both incentives (positive motivation) and compulsion tools (negative motivation). Different experts assess the condition of nature use economics and nature of current economic tools in Russia differently.

For example, Girusov in his work "Ecology and Economics of Nature Use" divides economic instruments in the area of environmental protection as follows:

1. Incentives

Feature prevalence of market tools and creation of favorable economic environment for developing environmentally clean production and other types of activities.

2. Strict

Used together with compulsion administrative, financial and economic tools and suppression of environmentally hazardous industries by means of firm tax policy.

3. Benign

Establishment of liberal restrictive environmental limits that influence the rate and scale of environmental development relatively weakly (Girusov, 1998). Girusov makes a conclusion that it is the benign regulation mechanism that has been formed in Russia.

In the opinion of Fedotova, who refers to the interview with the Director of the Department of State Policy in the Area of Environmental Protection of the Ministry of Natural Resources of Russia Ishkov A.G., restrictive economic measures prevail in the country. Besides, this author divides economic tools according to the following principle:

Punishment

1. Payment for negative environmental impacts viz:

- emissions of pollutants into the air;
- discharge of pollutants and other substances and microorganisms into surface and ground water and into water catchment area;
- dumping of production and consumption wastes;
- pollution of the interior of the Earth and soils;
- pollution of the environment with noise, warmth, electromagnetic, ionizing and other physical impacts.

2. Compensation of damages inflicted to the environment and human health (Law on environmental protection, 2002)

3. Taxes:

- excises for certain types of mineral raw materials;
- tax on extraction of mineral deposits;
- water tax;
- fees for the use of animal world units and for the use of water biological resources;
- transportation tax;
- land tax. (Tax Code, 1998)

Stimulation

1. Federal programs in the area of environmental development of the RF; target programs of the subjects of the RF in the area of environmental protection and their activities on environmental protection

2. State support to entrepreneurial and innovation activities implemented for environmental protection by taxation and other incentives

3. Taxation and other incentives for the introduction of the best available technologies, non-traditional types of energy, use of secondary resources and recycling of wastes

4. Investment tax loan for research or experimental developments, or for technical re-equipment aimed at nature protection (Tax Code, 1998)

5. Environmental insurance

All the above listed economic tools of environmental management are envisaged in the Russian legislation. However, regardless of the ways of their impact on the enterprise, the scale of their use is still very limited.

One should note that economic tools identified in the current legislation (annex...) as being incentives do not meet the definition used in developed countries neither by their nature nor by the mechanisms of their implementation. In accordance with the definition suggested by OECD: "Economic instruments, as contrary to direct regulation, leave actors free to respond to certain stimuli in a way they themselves think most beneficial" (OECD, 1989). It is possible that nominal participation of companies in federal target programs and environmental insurance can be regarded to be motivation mechanisms. However implementation of those norms is hindered by the lack of legislation and administrative barriers.

Economic incentives mechanisms, such as discounted taxation, beneficial access to state guarantees for loans or direct discounted crediting by state banks, and calculation of expedited amortization, that are rather widely used in the world, are almost not used in Russia (Fedotova, 2006), although Art. 14 of the Law "Environmental protection" directly identifies the necessity of their introduction (Federal Law, 2002). One of the reasons is the lack of clear mechanism of their enforcement. The mechanism of granting deductions established by law is inefficient, as it does not envisage control over the final result of environmental protection activities. Therefore, it is impossible to trace the efficiency of the benefits provided.

One can maintain that environmental federal, regional and local target programs are a working tool in that group, because financial means are provided for specific nature conservation activities, and their implementation is strictly controlled. Unfortunately, access to the resources of the program is hindered. According to the version of unofficial source from a federal ministry, the money for environmental federal target programs, as a rule, is distributed before approval of the programs. Therefore, the enterprises that have no access to decision-making have no chance for receiving support from the state. Speaking about BAT, there are no criteria for selecting the technologies, and mechanisms for providing privileges are not thoroughly elaborated.



## Environmental payment

The basis for the economic mechanism for environmental protection in Russia is environmental payments. Payment for negative environmental impact is one of the few working forms of economic regulation. Nevertheless, in average it makes only 0,5% of all taxes paid by a company. The amount of all nature protection taxes and payments of an enterprise does not exceed 3% (depending on the branch of industry) of the total sum of the taxes of the enterprise, what, naturally, does not stimulate them to save resources and reduce negative environmental impact (Fedotova, 2006). The situation at Solikamsk magnesium plant (SMP) in Perm region is referred to as being an "explicit negative example". The representative of the Federal Agency of water resources of Kamsk Ildus Jusupov called the enterprise "one of the most serious perpetrators" in the region. According to his estimations, in 2007 only, the damage to the environment by illegal emissions from SPM totaled to 57 billion RUR.. The Head of the Environmental Protection Bureau of the SPT confirmed in his public announcement that the plant was actually discharging wastewater into the

river. "There are no documents. Of course I admit that the emissions are illegal, he said. But we are working on that." Such calmness of the representatives of the enterprise can be easily explained: administrative fee for the law violations listed above made only 89,7 thousand RUR (appr. EUR 2037)(http://www.ng.ru/economics/2008-08-07/4_ecology.html).

From the theoretical point of view, the most feasible way is to get income by mans of direct payments for natural resource use (Kaveshnikov, 2006). Only in that case payments become an effective economic mechanism for using natural resources. Being the owner and loosing a huge part of the rent for the use of resources, the government does not act as efficient owner. The income obtained from the rent for the use of natural resources could be one of the main income sources for the budget of the country. So far, the rent income has been compensated some how by indirect taxation, what makes only "several percent of the rent income" (Kasyanov, 2001). In this situation, nature users, who orient their activities towards the use of natural resources of Russia get — due to mass-scale environmental impact — «excess profits», equivalent to dozens of billions USD that remain abroad (Kaveshnikov, 2006).

Besides payments for negative environmental impact, the following measures have been widely spread in the area of environmental protection management: taxes and fees for environmental law violations and claims for the compensation of damages inflicted to the environment. The use of the following measures is limited: tax incentives for the activities in the area of environmental protection, discounted loans, guarantees for loans, subsidizing loan interest rates etc. At present, the following is not used: amortization policy in relation to production funds for nature protection, or special prices for environmentally-friendly products (Bondarenko, ?).

## Tax incentives

The Federal Law in environmental protection envisages taxation and other benefits. Art. 14 reads that it is possible only if the best available technologies are applied or "non-traditional" types of energy, if secondary raw materials and wastes are used, or affective environmental protection measures are taken. Payment for negative environmental impact is non-taxation income of the budget, i.e. it is subject to taxation legislation. Today, the Tax Code of the Russian Federation (1998) has no provisions specifying procedures for providing tax incentives to nature users. As a result, there are no economic stimuli for nature conservation activities.

The only thing that can be offered to the natural resource user by the current Taxation Code is investment tax load (Art. 67). "Investment tax credit can be provided to the organization, which is a taxpayer of a certain tax" in the following cases:

- the organization runs research or testing activities or upgrades its production facilities;

- the organization carries out innovation activities or introduces a new technology, including development of new technologies or creation new ones, creation or new types of raw materials or materials (Tax Code of Russia, 1998).

Investment taxation loan is the change of terms for paying the tax. When such a loan is provided, the organization gets an opportunity to reduce tax payments for a certain period of time and within certain limits with subsequent stage-by-stage repayment of the loan and respective interest. We doubt that such a mechanism can be an incentive for an enterprise. As a rule, upgrade of production facilities is a costly endeavor. Due to the lack of other mechanisms those costs are covered from the equity funds of the

company. Additional burden in the form of the interest for the taxation loan not only aggravates the situation of the enterprise, but can be the reason for its going bankrupt.

More of that, we should note that legislation and norms of specific sectors, such as Land Code, Water Code, Federal Law on Animal World, fix taxes: taxes on water and land, excises on specific kinds of mineral raw materials, tax on extraction of mineral deposits, fees for using animal world units and for the use of water biological resources units, and transport tax. Due to the direct link to the elements of the environment such payments are referred to as nature protection or environmental ones. Besides, there is no independent legislation targeted specifically at the companies causing the worst pollution. Neither in practice nor in legislation there is no differentiation in environmental requirements and procedures of getting permits. Therefore, the latter procedures are not adapted for different industrial activities. According to some experts, the key taxation principles are that the amount of the tax should correspond to economic opportunities of the taxpayer, i.e. the level of his income (Karev, 2006). As economic opportunities of different nature users differ, it would be feasible to set differentiated taxation rates for them. For instance, in the USA for the same volume of water used industrial enterprises pay by 30-40% more than agricultural companies (Karev, 2006).

Nevertheless, the amount of all nature protection taxes and payments of an enterprise does not exceed 3% (depending on the branch of industry) of the total sum of the taxes of the enterprise, what, naturally, does not stimulate them to save resources and reduce negative environmental impact (Fedotova, 2006). Besides, despite of the ratification of Kyoto Protocol by Russian and respective liabilities, there is no group of taxes contributing to the reduction of carbon dioxide emissions and increase of effectiveness of transport and energy sectors.

Among the economic tools for environmental protection we should especially mention amortization policy in relation to main production assets used for nature conservation. Increased norms of amortization for nature conservation assets were established in the Law on environmental protection; however, in the current Law on environmental protection expedited amortization of treatment plants and nature conservation equipment is not envisaged, what hinders the enhancement of renewing nature conservation assets and abruptly aggravates equipment of the enterprises even with available nature conservation assets (Bondarenko, ?). Although the Law on environmental protection envisages tax incentives, in practice they are almost never applied as there is no clear mechanism for them.

Therefore, we can draw a conclusion that there are no practically motivating economic tools in Russia. Besides, incentives for emission and discharge reduction that are directly stated in the Law on environmental protection are almost not applied.



## 6.1 Prerequisites for reforming management in the area of environmental economics

Basic barriers on the way of introducing economic incentives for the industrial sector in Russia were identified in the framework of the TACIS project "Harmonization of Environmental Legislation, Russia". In particular, it was a hard situation of many enterprises, too many employees in nature conservation authorities and ineffectiveness of federal agencies involved in the process of providing permits. Besides, a serious problem was lack of investment resources and lack of qualified staff. Strengthening of integration processes under the conditions of globalization raises the requirements for environmental safety and social

responsibility of business to a new level. Russia intends to join the World Trade Organization (WTO) what implies switch to internationally recognized management procedures that allow to harmonize economic, environmental and social interests, needs and duties in the area of business, in particular, the ones in the area of nature use (Zhurbin, 2007).

As the analysis of available international experience demonstrates (Fedotova, 2006), recently the development and introduction of environmental management systems belong to universal tools that guarantee executing environmental duties by enterprises. Besides practical change of attitudes by the enterprises, such systems serve as reliable beacons for consumers and motivate their behavior on the market with the account for environmental and social factors. Under those conditions, some experts suggest a wider interpretation of nature use economics as a science of choosing and making affective decisions (Golub, Strukova, 1993). From this point of view environmental management should be a set of measures that ensure such requirements to the activities of an enterprise as cost effectiveness and environmental balance, and also they should meet the interests of the society.

Russia is special because in the process of forming the systems of environmental management special attention should be paid to strengthening regulations by the state and tools of administrative impact in the area of nature use. This may be implemented by introducing environmental standards, developing a mechanism of incentives for manufacturers of environmentally-friendly products, managing environmental and economic risks, establishing a mechanism of financial and other guarantees for possibly negative environmental impact etc. (Zhurbin, 2007)

Figure 6-1 shows prerequisites and factors of incentives for an enterprise for nature conservation activities. On the basis of the scheme we can make a conclusion that external influence on the management of an enterprise plays a big role as motivation.

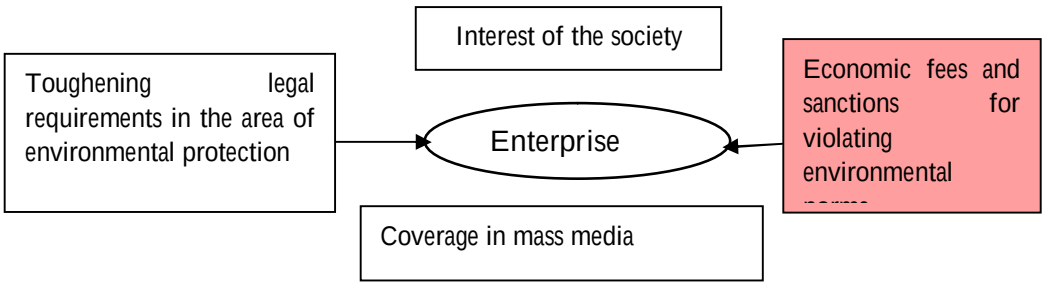



Figure 6-1 External impact on an enterprise with the aim to motivate to solve environmental issues (Zhurbin, 2007)

However, in the opinion of the author, it is economic and fiscal interaction of executive authorities with the industrial sector that is effective.

Incentives of an industrial enterprise for using encouraging economic tools are formed by several factors. Artificially they can be divided into two groups: internal and external incentives (Zhurbin, 2007). External incentives are based on the obligation of the company to observe international environmental standards and the necessity to secure competitiveness of its products. Internal incentives, as a rule, are based on the necessity to meet the requirements of environmental legislation. This group might include the possibility to

benefit from nature conservation activities. For example, it can be introduction of environmentally friendly innovative equipment.

Today in Russia, as it was mentioned before, the only really working fiscal mechanism of influencing enterprises is payment for negative environmental impact. In this respect this economic tool seems to be the most promising one in terms of its enhancement.

## 6.2 Payment for negative environmental impact

The basis for the economic mechanism for environmental protection in Russia is environmental payments. Payment for negative environmental impact is one of the few working forms of economic regulation. The executive authority responsible for managing environmental payment is Federal Service of Technological, Environmental and Atomic Control (FSTEAC, 2005). According to the data provided by the Service in its annual statistical report, payments from the enterprises for negative environmental impact are shown in Table 6-1:

| | 2005 | 2006 | 2007 |
|---|---|---|---|
| Received payments for environmental pollution (million. Rubles) | 2313,5 | 2498,6 | 2698,5 |
| Approximate equivalent in Euros | 57,8 | 62,4 | 67,4 |

Table 6-1 Payment for environmental pollution during the reporting period (FSTEAC, 2005)

Environmental payments are administered and their mechanism is implemented in accordance with the Governmental Decrees on Approval of the procedure of payment calculation for environmental pollution, waste distribution and other types of negative impacts and on Rates of environmental payments (1992). The main principles those documents are based on are follows:

- payment for negative environmental impact is compulsory and it is aimed at reducing emissions and discharges;
- the list of negative impacts envisaged in federal legislation is full;
- payment is due depending on the volume of pollutants produced during the reporting period.

According to the procedure of calculating the amount of payment set by the Decrees of the Government mentioned above, there are two types of basic payment fees:

а) within the norms, i.e. fees established by the Government that match a pollutant, type of pollution and level of risk for the health of people and environment;

б) within the limits (temporarily agreed norms), i.e. the fees within the limits are multiplied by the difference between the limit and the norm. The results of the calculations are summed up depending on the type of pollution.

In case of the level of pollution exceeds the established limit, payment is taken with fivefold coefficient. Moreover, the payment does not relieve enterprises from their duty to carry out compensation and environmental activities (Governmental Decree, 1992).

At present, regional executive authorities are responsible for issuing permits for emissions and discharges (Appendix 2). In this respect one has to admit that the system features individual decision-making and it does not work effectively. On the one hand, there is no one-window system. In order to get a permit and register the volume of pollution consumers have to visit several authorities. On the other hand, the existing system of charging payments provides all conditions for bribery. Therefore, we should admit that the system of payments for negative environmental impact needs reforming.

Procedures for calculating payments for the negative environmental impact are a significant factor for investment climate, which has a direct effect on the rate of economic development of the country. The scale of the burden of those payments on business environment is steadily increasing turning them into critically important condition for running business (FSETAC, 2007). Therefore, corruption potential increases in connection with respective relations. Besides, environmental fee is a non-taxation income for the budget of the country, i.e. it impacts the budget together with other regular payments. This factor increases their public significance.

Payment is a separate and special economic regulation tool, which is to be shaped in such a way that its administration should be a burden neither for payers, nor for supervising bodies. It means that it is necessary to quit all infeasible administration of the payment. The list of pollutants established by the Statute of the Government No. 344 contains over 350 entries. At the same time, payment for the negative impact from 40 of them makes over 95% of the total payment to the budget. Therefore, administration of the other pollutants turns out to be higher than the emission payment.

Russian researchers have repeatedly highlighted the deficiency of the existing payment system with its numerous entries as «this system is far from being perfect and the mechanism resting on it is rather inefficient» (Kasyanov, 2001). As the law enforcement practice has shown, the systems of payments for the negative environmental impact features serious disadvantages. The latter include, first of all, the fiscal attitude to nature users. With such as attitude, the payment has no subsequent target use. The resources obtained are transferred to the budget and do not encourage enterprises to reduce the negative environmental impact. Another disadvantage is that the amount of payment is fixed by individual decisions made by federal executive officials. In this respect one has to admit that the system features individual decision-making and it does not work effectively. In addition there is no one-window system. In order to get a permit and register the volume of pollution consumers have to visit several authorities. Such an approach suffers from subjectivity and bureaucratic fraud, and it is a condition for corruption.

Legal basis is not sufficiently developed. Sometimes the normative acts adopted deteriorate the environmental situation, which is complicated anyways (Council of Federation, 2008). For example, the order of Rostechnadzor "Approval of the form of calculating the payments for the negative environmental impact" (05.04.2007, №204). This document changed the procedures for calculating payments for allocation of wastes, thus violating the current legislation. This decision resulted in the increase of the payment to the amounts incompatible with economic activities (Council of Federation, 2008).

In addition, I would like to note that at present there are discussions going on among executive authorities on the lawfulness of providing temporary permits. The opponents of the existing system believe that environmental impact is negative from the very beginning and cannot be "within the norm". Also the opponents want payments to increase. Environmental committee of the State Duma of the Russian Federation developed a draft law "Payment for the negative environmental impact" (2005). The concept of the law envisages the introduction of a technological system of norming the negative impact. Such a system is different from the existing norming system. It is based on technological norms of pollution under the use of a certain technology. The draft law establishes a system of incentives for introducing the best available technologies (BAT) (State Duma, 2006).

Such a practice allows to minimize the costs at both the stage of production by saving resources and at the final stage by reducing technogenic pollution and production wastes. Reduction of wastes is encouraged by the use of coefficients when calculating the payment in relation to the admissible norms pertinent to a specific technology. The payment increases with the help of the coefficient in case of exceeding the norm (State Duma, 2006). Therefore, introduction of the principle for the payment, amount of which depends on technology applied, excludes individual approach to each payer and dependence on bureaucrats.

From my point of view, the key achievement of this draft law is that the payment mechanism gets is target designation back by means of payment deductions in case the nature user carries out nature conservation activities at his own expense. The law considers Introduction of BAT as a nature conservation activity. At the same time, the investment turnover of the equity fund of the enterprise subject to deduction is envisaged for the period of 5-10 years (State Duma, 2006). Thus, due to the new payment mechanism a new source of financing of technical upgrade appears as well as switch to energy efficient technology.

Preservation of the basics of the environmental balance of nature and human impact is possible only if the economic incentives are effective together with rational nature resource use, application of resource and energy saving technologies and securing necessary reproduction of renewable natural resources. As it was mentioned before, industrial companied are ready not only to participate in governmental nature conservation initiatives but also to invest their own money in developing environmentally-friendly innovative technologies . In turn, governmental agencies support the switch to technological norming by draft laws and they have necessary legislative basis for the effective work of economic stimulating tools based on BAT. In this respect, upgrade of the current mechanism of payments for the negative environmental impact on the basis of technological differentiation of enterprises seems to be the most realistic option.

# 7. Best Available Technology as basis for incentive economic instruments

The Federal Law "Technical regulation" (2002), which is the basis for the development of industry together with environmental security, makes implementation of the BAT system compulsory in the Russian Federation. It is this law that envisages the shift of Russia to the international standards that should be legally fixed by Federal Laws on technical norms. The Federal Law "Environmental Protection" (2002) envisages a new system for nature conservation norms based on the use of the principle of the best available technologies (the principle of BAT in the EU system of standards). Under the modern market conditions the gradual shift to BAT makes a tangible practical effect, especially under the condition of permanent increase of tariffs for electricity, transportation and future pay for natural resource use (http://centrecp.narod.ru/is-nefco.htm).

Switch to norming the environmental impact in Russia on the basis of the best available technologies implies switching from the current system of individual norming (PDV, PDS, allocation of wastes etc.) to the comprehensive identification of the environmental impact on a company with a unified comprehensive permit for a certain period of time. The company should take into account not only some industrial pollution sources but also opportunities for the effective use of raw materials and energy. Therefore, the issue of BAT concerns not only treatment equipment but also the whole production process.

At present, there is no norming system based on the best available technologies (BAT), and it will not appear till identification of criteria and procedures for norming this system. As a rule, companies associate the requirements for environmental norms with the need for increasing financial investments without any benefits for the company. The opinion prevail that BAT implementation always leads to the need for investing in a new technology. Considerable part of equipment might be in such a bad condition that upgrade of such facilities is not feasible and complete replacement of the equipment is required (TACIS, 2003).

Does application of environmentally-friendly (safe) equipment or processes increase or decrease productivity and costs of companies? It is often believed that Russian companies perceive costs for nature conservation as hard and useless financial burden (pers.comm.Zhukov). Answers to that question received during the poll by WWF in Russia give grounds for optimism. None of the respondents said that application of environmentally-friendly equipment leads to the reduction of productivity, and 24 companies believed that it increases production. Besides, many companies mentioned "prevention of excess negative environmental impact of facilities of the company (accidents and other emergencies) due to more advanced and reliable equipment, technologies and environmental culture of production" among the principles and corporate values (WWF Russia, 2007). As practice shows, large enterprises are ready to invest their resources in upgrading facilities with the aim to reduce environmental impact. For instance, "Nornikel" intends to spend 1 billion Euros in the coming 2-3 years (pers. comm. Peretruhina).

Besides, foreign investment organizations can be sources of financing. NEFCO can be such an example. Nordic Environmental Finance Corporation is an international loan and financial facility established in 1990 by five Nordic countries: Denmark, Finland, Iceland, Norway and Sweden. NEFCO provides financial support to the implementation of a wide range of environmentally important projects in the countries of

Central and Eastern Europe, including Russia, Belarus and Ukraine (http://www.balticlive.ru/index.php?p=54&co=67).

The main activities of NEFCO are aimed at crediting cost-effective projects that allow to improve the environment in the whole region. Today the investment portfolio of NEFCO has 245 projects in Russia. The key investment areas are energy sector, industry, renewable energy sources, agricultural sector, waste recycling and water supply. In 1995, the corporation, with support from the ministers of environment of Nordic countries founded Nordic Environmental Development Fund. Via the fund, NEFCO uses all opportunities for supporting projects that cannot be otherwise implemented or can be implemented only in the long run. Local co-financing is a must for those projects. The fund provides financial support by grants for purchasing goods and services (monetary subsidies) or by reducing the costs of the debtor for servicing the debt. Investment opportunities of the fund make approximately 300 million DKK (http://www.nefco.org/ru/financing).

Financing BAT at the expense of federal programs at the moment seems difficult. In 2004, Art. 15 "Federal programs in the area of environmental development of the Russian Federation, target programs in the area of environmental protection of the subjects of the Russian Federation and environmental activities" was removed from the Federal Law "Environmental Protection". Because of that the process of centralized financing of nature conservation activities fell out of competence of federal executive authorities. Several executive authorities are dealing with the issues of research and technical environmental development, implementation of the best available technologies, processing of accumulated wastes, methodologies of technological norming, and intersectoral and international cooperation, and they often overlap (Council of Federation, 2008).

In the opinion of the experts, in case of implementing BAT, achievement of commercial benefits for the company depends only on the company itself. Implementation of BAT at industrial plants will increase the attractiveness of reducing the established emission norms and discharges of pollutants. Besides, this will become the starting point for implementing technological innovations. In turn, innovation technologies will allow to save resources of the company and increase profits. Potential savings of costs will be determined by reducing:

- use of raw materials
- production of solid wastes and their disposal
- volumes of wastewater
- air emissions of pollutants
- environmental fees and penalties (TACIS, 2003).

As BAT system has not been widely used in Russia, it would be logical to assume that companies might need the help of foreign experts. Unfortunately, the enterprises are not used to working with consultants and are reluctant to use their experience for implementing BAT. At present, there is a lack of consultants with relevant qualification and lack of financial resources. Often times, companies cannot pay for the services of consultants if they want to use them (TACIS, 2003). Besides, there is a lack of local manufacturers and suppliers of machines and equipment.

In turn, representatives of federal agencies also support the implementation of technological norms into BAT systems in Russia. As the Director of the Dept. of State Environmental Policy, R.Gizatulin, explained in the interview in Kommersant newspaper (14.03.08), the Ministry of Natural Resources suggests absolving the enterprises meeting BAT-equal norms from environmental payments. The same article highlighted that experts are skeptical about the implementation of the plans verbalized by Gizatulin. The doubts of NGO representatives are motivated by the fact that proposals for introducing BAT system have been under discussion for 7 years already. Executive authorities have not arrived at a solution. However, despite the lack of the legal basis for implementing the BAT system at the moment, the Government of the Russian Federation appeals Russian industries to account for international standards. The Minister of Natural Resources and Environment RF Jurii Trutnev declared that design and construction organizations will fully implement additional environmental requirements and use the best available technologies when building facilities for the Olympic games in 2014 in Sochi (http://www.mnr.gov.ru/part/?act=print&id=5642&pid=11). Besides, Russia has signed several international conventions and agreements, including Kyoto Protocol, in accordance with which the country is obliged to reduce the negative environmental impact, what is possible by means of the best available technologies.

For Russian companies implementation of BAT might mean some direct and indirect benefits. Switch to technological norming will allow to avoid unified and strict norms for all. Practice has shown that strict but averaged for all natural users environmental standards (norms) cannot be achieved due the diversity of the environment, raw materials and production processes. In case of BAT implementation, specific norms that do not imply any mitigation under any circumstances are set in individual permits, controlled by authorized bodies and are made more stringent in case of not meeting certain criteria. Taking into account the complexity of the Russian system for issuing permits for pollution (Annex...), transparency and openness of BAT procedures will be more attractive. EU Directive..., which can be taken as a basis for developing national mechanism, envisages public consultation. In that case there is chance of accounting for the interest of all stakeholders, i.e. public, state and business. In view of the usefulness for the environment, BAT regime is a mechanism aimed at continuous improvement, and not at formal observance of norms and rules. During modernization of production, the level of pollution at enterprises permanently decreases. This is achieved under the condition of maintaining economic effectiveness and incentives for technological development of the company.



## 7.1 Selection of technology

The issue of selecting BAT is the key one for introducing technological norming, and BAT selected for a specific enterprise should meet the following key requirements:

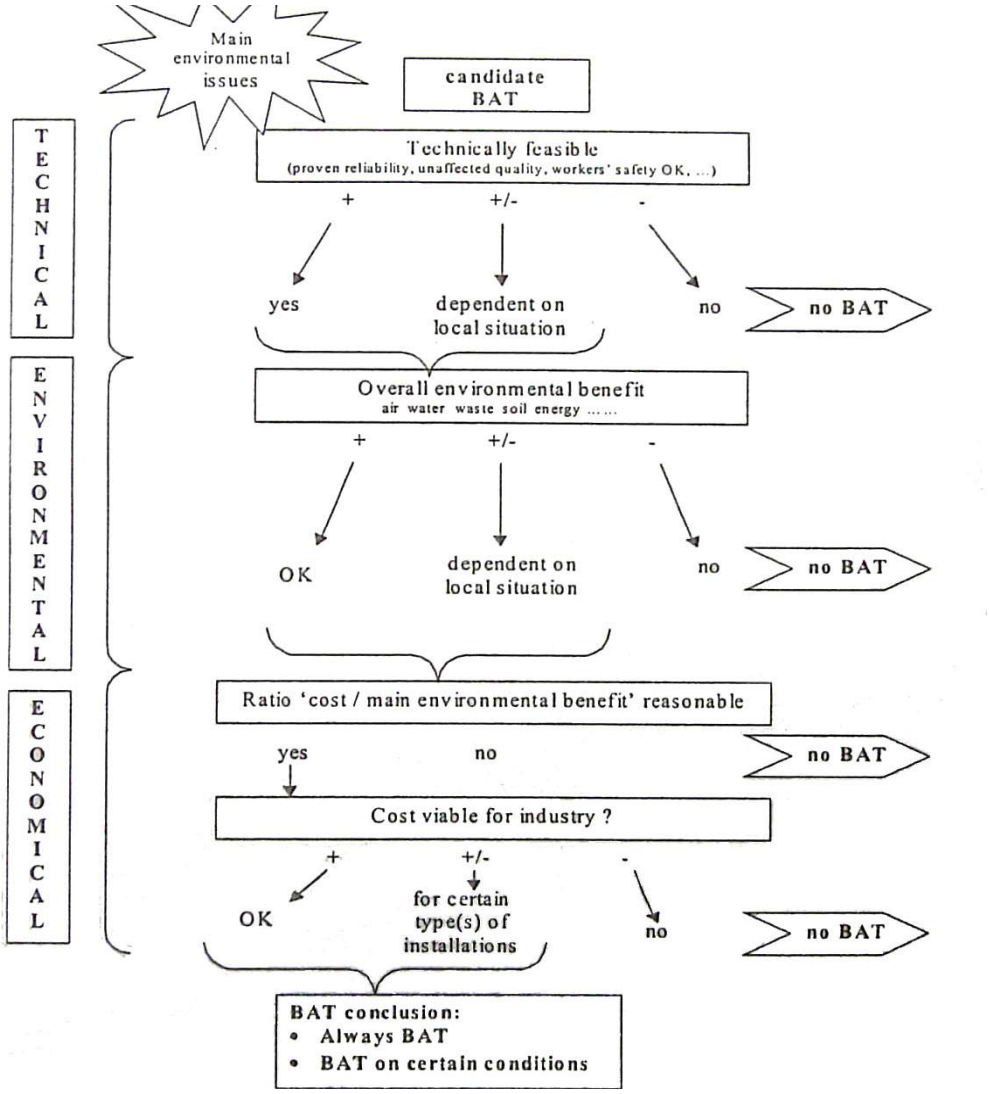
- ffeasibility of applying that technology in terms of the environment, i.e. minimization of human environmental impact;
- the technology should be relevant to the newest domestic and foreign developments in that industry; economic and practical acceptance of that technology for the enterprise (Model law, 2007).

Belgium organization VITO developed a guide on identifying the effectiveness of using BAT (VITO, 2001) (Figure 7-1). According to the guide, one of the most important conditions is availability of different versions

of technologies. For this purpose, lists of applicable BAT are made and approved at the governmental level. When technologies are known, they should be assessed in terms of their practical manageability, i.e.:

- Is the BAT implementation project technically manageable? Will is effect quality, social and other conditions?
- Will it lead to environmental benefits? It is important to identify here, will the use of the technology result in comprehensive improvement of the environmental quality. It is necessary to analyze the impact of the technology on all stages of the production process.
- And finally, environmental assessment is necessary. From the point of view of the profits of the company, environmental benefits cannot exceed economic ones. Besides, it is important to select suitable time, i.e. suitable economic cycle (level) of the company. Therefore, implementation of BAT together with other necessary investments can reduce overall costs.

Figure 7-1 BAT selection process



## 7.2 Experience of Russian companies in introducing BAT

In the Russian Federation, transition to environmentally cleaner production actively started since 1994 in the framework of the intergovernmental agreement on environmental cooperation between Russia and Norway (1992). By that time Norway had developed and introduced its own cleaner production methodology at its enterprises, and in 1990–1994 it implemented it in such European countries as Poland, Check Republic, Slovakia, and Lithuania. Later the program was also implemented in China.

Clean production means consistent application of a unified preventive environmental protection strategy in relation to processes and goods with the aim to reduce risks for people and the environment. In relation to production processes, clean production implies saving raw materials and energy, withdrawal of toxic raw materials, reduction of volumes and toxicity of all emissions and wastes till before the end of production process. In relation to goods the strategy focuses on interrelations of impacts made by the goods during their whole life cycle starting from the extraction of raw materials used for their production and up to their disposal. Clean production is achieved by using know-now, improvement of technologies and/or changing attitudes.

Training program on clean production has been conducted at many enterprises of Northwest Russia, such as Severonikel, Apatity, Pechenganikel, at Solombola, Archangelsk, and Kondopoga pulp-and-paper mills, at the State center of nuclear vessel building, Severstal, Archenergo, at October and Severnaya railroads, as well as food industries and municipal utilities. In the Republic of Karelia, the clean production program was conducted at each pulp-and-paper mill (Segezha, Kondopoga, Pitkaranta), because they make strong impact on the biosphere of such important lakes as Ladoga and Onego.

We should note that implementation of innovative technologies for ensuring the quality of the environment is not a novelty for Russian industrial companies. In some regions they have already launched the implementation of the norms of the Federal law "Technical Regulation" in the part of the implementation of technical norming based on BAT principles. There are a lot of positive examples of the implementation of investment programs that have significantly changed technological and environmental situation at the enterprises, especially in the North-West region of Russia. At OAO " Mondi Business Paper – Syktyvkarkii LPH" modernization of the main technological equipment was done and BAT were introduced. The costs were about 300 m RUR. As a result, the negative environmental impact is at the level of international environmental standards. Compared to 2004-2005, the company has reached the following results:

- energy saving – 4%;
- reduction of $CO_2$ and AOX emissions by 11% and 62% respectively;
- reduction of pollutants into water bodies – 25%;
- reduction of waste production – 22% (Mondi Group, 2008).

OAO Ilim Group is the largest manufacturer of pulp, paper and packages for Russian and foreign markets. Ilim Group adopted a policy in labor safety, industrial and environmental safety. The policy was developed with the account for Russian requirements, experience of Ilim Group and international standards adopted by International Paper. The position of the company in the area of environmental safety is targeted at the implementation of environmentally friendly technologies at all stages of production starting from timber harvesting and up to production of paper and packages. Implementation of projects contributing to saving electricity and increasing the effectiveness of its use with the best available technologies, including the

projects on incineration of secondary fuel and reduction of GHG emissions, is one of the priority areas of the activities of the company for the period till 2012 (Ilim Group, 2008). «PO UST-Ilimskii LPK» has modernized its wastewater treatment plant, gas purification and dust filters, and works were done on treatment of solid industrial wastes, what allowed to reduce harmful air emissions by 15,2% (Council of Federation, 2008).

Expenditures of Arkhangelsk Pulp and Paper Mill on environmental activities (2008), mln.rubles

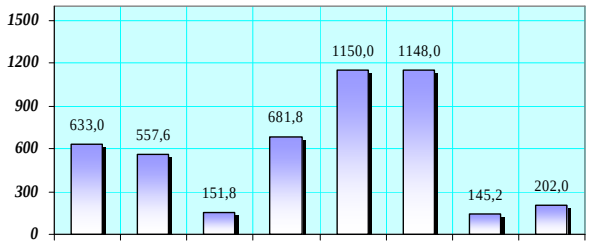
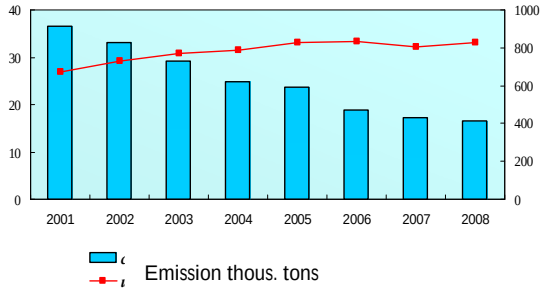



Figure 7-2

Thanks to modernization of technological processes at OAO Arkhangelskii TSBK discharge of pollutants into the water was reduced by 15,7%, and air pollution — by 21,8%. The total gross discharge of pollutants into the water in 2008, compared to 2007, reduced by 4.4%. Sodium sulphate discharge decreased by 350,140 t or by 24,3 % due to better treatment. In 2008, compared to 2007, the volume of the wastes disposed of at the landfill reduced by 12%. By introducing BAT the enterprises not only significantly improved environmental results but also increased the income increment. Figure... shows that the enterprise succeeded in not only improving the level of pulp production, but to raise it. At the same time, emissions have considerably dropped during the last to years.

Figure 7-3 Level of emission and pulping at




## 7.3 Economic tools for introducing BAT

All this might require additional costs from enterprises for environmental protection. There is even an opinion that it will hinder economic development. To avoid this EU legislation and practice contain different economic tools, including emission trading, that allow to distribute costs and gradually reduce appendages.

One should take into account that economic tools also have some disadvantages. During the process of introducing BAT additional costs come inevitably. Economic stimuli can require investments either from the enterprises, or from the government. For the industrial sector the costs might be from taxes and fees. For the state budget it means introduction of target allotments/subsidies. Some experts believe that in case of the implementation of in (TACIS 2003). However, the existing methods of calculation that are applied for developing projects in accordance with the mechanisms of Kyoto protocol allow to forecast the level of emissions relatively accurately. Besides, the experience of the enterprises that have already introduced BAT shows that innovation technologies not only make positive impact on the environment, but also help the enterprise make profits.

Taking into account that the system of environmental payments at present is the only actually working economic tool, it is plausible to build up a system of BAT on the basis of the payment for the negative environmental payment. Switching from technological norming it will be necessary to increase the rate of fees

for pollution. It is necessary given the current Russian environmental legislation. Too low rates devalue natural resources and do not encourage enterprises to run environmental activities. Experts of the Council of the Federation are worried that additional exaction might make adverse impact on economic condition of production (Council of Federation, 2008). For preventing negative consequences of increasing the rates it is reasonable to go back to the practice of environmental funds. In that case, enterprises might get financial assistance from the state for the period of BAT implementation. As it was mentioned above, environmental funds are made by means of environmental payments, but this is not the only way.

In Russia, an interesting experience is known of providing investment resources to enterprises. Since 1995, a Russian program for organizing investments in the environment has been implemented in the Russian Federation (hereinafter RPOI), as a major part of environment management Project (hereinafter EMP), which is financed from the environmental loan from the International Bank of Reconstruction and Development (hereinafter IBRD) (RPOI, 2005). In compliance with the Loan Agreement, the key goal of the RPOI is piloting of the mechanisms of financial support that contribute to more rational investments in improving the environment by financing priority projects aimed at reducing environmental pollution and refinancing of different projects at the expense of return money accumulated in the framework of RPOI. The total amount of investment resources of the RPOI is about 64 million USD.

In the framework of RPOI adopted by the order of the Government of the Russian Federation on August 11, 1995 No. 808, agreements have been made between the Ministry of Finance of Russia and some Russian companies (chemical and pulp-and-paper industry) on sub-loan (budget loan), on a payback basis, for priority nature conservation investment projects in order to execute the Loan Agreement in the part of refinancing of RPOI resources received from subdebtors to cover liabilities for budget loans. By the order of the Ministry of Finance of the Russian Federation, RPOI account was opened in 2003, and 141 million RUR were transferred there on a payback basis on December 1, 2005, and they continue to accumulate (Ministry of economic development and trade of Russia, 2006).

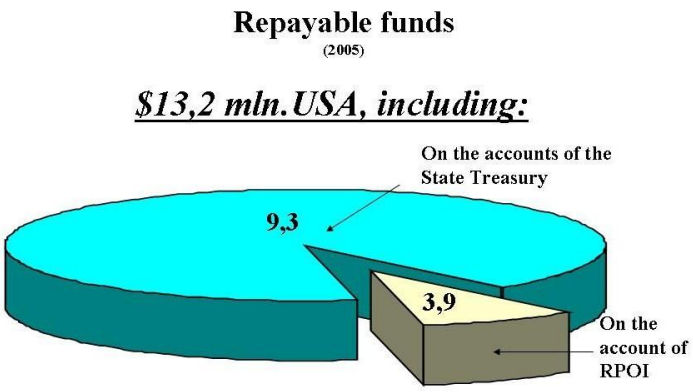


Figure 7-4 Repayable funds of RPOI

The mechanism described above would definitely be an effective stimulating economic tool, if not for some hindering administrative barriers. First of all, the means, i.e. the budget legislation of the Russian Federation has not identified procedures for providing and spending money received from the subdebtors. Therefore, the means are not accessible for refinancing in new environmental projects. Secondly, the interest rate for the loans for the final debtors who implement environmental projects is rather high (9-10% per year for loans in foreign currency). Besides, enterprises are required to provide liquid securities for the RPOI loan, what is practically impossible at most Russian enterprises that have environmental problems and that are potential clients of RPOI due to considerable depreciation (about 80%) of main equipment (MEDT, 2006).

In case of identifying procedures for spending RPOI money, the project could become an additional source of financing nature conservation activities in industry. Therefore, taking into account that environmental

funds appear and payment rates are increasing, the main economic tool in Russia for introducing BAT at the initial stage might be partial financing of environmental activities. Observance of that mechanism should be secured by strict production control at the enterprise and state environmental supervision.

## 7.4 Changes necessary for the environmental policy for introducing BAT

Definitely, for introducing BAT some changes will be required in environmental law. Principal change of the attitude to norming the environmental quality might effect economic results. Benefits for the environmental policy in that case should be pollution reduction and saving natural resources. The following elements are critical for applying BAT in Russia:

1. Law on the best available technologies.

The law should clearly identify the notion of BAT and implementation mechanism. The normative act should identify a federal body authorized to prepare and keep the list of the best available technologies as well as the rights and duties of the parties. In particular, not only the measures for administrative impact of the state on the enterprises should be included but also the opportunity for the enterprise to protect its interests against the arbitrariness of the state.

2. Transition to technological norming.

Following the provisions of Federal laws "Technical Regulation" and "Environmental Protection", the system of nature conservation norms should be reviewed. First of all, the norms must be developed in consistence with the pollution level from specific branches of industry. Also the amount of the input of the company into the economy of the country should be accounted for. Therefore, it will be possible to avoid additional burden for small and medium enterprises. Secondly, norms based on BAT introduction will allow to improve average environmental quality in the industry. For those purposes it is necessary to fix clear criteria for identifying specific maximum admissible impact and establish them at a real (achievable) rate. On the grounds of the mechanism established by the Federal law "Technical Regulation", compulsory methods should be elaborated for branches of industry in the framework of production processes.

3. Techniques for issuing comprehensive permits.

It will be needed to identify the authority of sectoral executive bodies locally, that have the right for issuing comprehensive permits and control over observance of their requirements. The system of environmental monitoring should be improved under the existing conditions.

4. Changes to the Fiscal Code of the Russian Federation

Changes should be made in the Fiscal Code in the part concerning establishing tax incentives for organizations implementing "the best available technologies" as well as payments for negative environmental impact that are calculated pursuing technological norms of "the best available technologies" for cases when the latter are exceeded.

5. Identification of the branches of industry.

Industries are to be identified that are subject to the new law in order to avoid additional burdens for medium and small enterprises and to reduce bureaucratic procedures. Taking into account the experience of

developed countries it is feasible to focus attention at the level of the development of the branch and on the "dirtiest" industries.

6. Independent consulting body

Taking into account that the process of BAT introductions also involves different parties, such as the government, society and business, a need might arise to create a separate consulting body. Such a body might act as an intermediary in settling disputes and to guarantee the interests of the parties that are established by law, including protection of rights in court. For instance, a commission may be formed consisting of the representatives of all stakeholders, including researchers and non-governmental environmental organizations.

7. Qualified specialists

At present there is a lack of qualified specialists in the area of BAT both in governmental bodies and at the enterprises. Specialists participating in the process of BAT introduction should not only have an idea of the Russian environmental law, but also develop experience of international cooperation.

All those measures will not require significant additional budget costs. In case of reviewing the norming system, costs will be reduced for administering the payment for the negative impact. In turn, the enterprises will more willingly consider the possibility of business-to-government cooperation. It will allow developing the system of stimulating tools and switching from command and control approach к incentives based system.

# 8. Conclusions

Formally the environmental legislation of Russia covers all issues of environmental protection; however, in practice it secures neither prevention of environmental consequences of economic activities nor protection of people's health. In principle, environmental legislation of the RF corresponds to the approaches and attitudes accepted in the EU and in international relations. Nevertheless, it is characterized by extreme complexity of bureaucratic procedures and it sometimes unjustified hindrances for manufacturers. Federal environmental protection agencies overlap in the area of ecological monitoring. Procrastinated procedure of issuing permits, which eventually depends on an individual decision by an individual clerk, forces nature users to use corruptive methods. Financial and human resources of governmental bodies responsible for issuing permits and control are very limited. All this is an indirect barrier for the economic development of the country.

Nature conservation legislation as well as methods for environmental norming and control over the condition of the environment do not meet market principles:

norms for emissions and discharges are fixed on the basis of too strict standards and do not account for special features of technologies of industries;

the system of nature use permits is complex and time-consuming

there is no link between the norming system, the best available technologies and incentives for switching to such technologies;

the previous compensation mechanism of economic regulation in the area of environmental protection has seized to exist;

environmental fees have actually turned into an additional source of replenishing the budget.

Costs for law enforcement administrative actions (setting up norms, issuing permits and control) are too big and are not always justified. The conditions of the permits for emissions and discharges are violated too often. Vague wording hindering interpretation is frequent. Thus, although the law "Environmental protection" the term "the best available technologies" is defined, it is not clear how those norms match other environmental requirements.

Actually there are no incentives for nature conservation efforts of companies. Awards for reducing emissions or discharges mentioned in the Law "Environmental Protection" are not envisaged. There are dozens of tremendously difficult and confusing methods in the area of norming that are not accessible for many stakeholders. Non-specialist is not capable of checking calculations, although lawful environmental rights and interests of people and fate of production facilities often depend on that. In fact, the norming system for the environmental quality is aimed at enlarging the budget at the expense of nature users and not at environmental protection.

During the last 20 years the decisive area of improving the norming of admissible environmental impact has been permanent reduction of the values of the norms for emissions and discharges and enlargement of the list of pollutants; however, such an approach has not ensured conservation and improvement of the environment. Strict and sometimes unachievable environmental requirements for all nature users increase production costs considerably and cannot be implemented in the system of governmental environmental control, and they lead to actual reduction of competitiveness of enterprises or suspension of their activities.

Enhancement of the norming system in the area of environmental protection should follow the key goal of creating a system of state regulation of the impact of economic activities on the environment, which guarantees consistent reduction of negative impact per production unit, preservation of favorable habitat and securing environmental safety. It is indispensable to create a "concise" norming system harmonized with the international norms, clear identification of authority of governmental bodies that approve environmental norms. Environmental impact should be normed on the grounds of a principally limited list of the key polluting substances or compounds of substances.

When developing norms for the admissible impact it is necessary to take into account the actual technological production level, resource and financial potential of domestic industry, natural, climate and landscape conditions, differentiation of territories by all types of human environmental impact (including natural recovery potential of the territories), population density as well as the level of pollution during the previous period.

The best way out of the existing situation is gradual switch to technological norming of the environmental impact on the basis of the best available technologies and methods that can ensure the reduction of the negative environmental impact as well as the increase of energy and resource effectiveness. At present, there is a real chance of developing a well-considered norming system with clear identification of the authority of different bodies, intersectoral cooperation and coordination in the area of norming, attraction of research potential from production industries to developing the system of technological norming, and creating data banks on the best technologies and alternative solutions. In the Russian Federation a system should be introduced for comprehensive nature conservation permits on the basis of BAT in the industries that make the worst negative environmental impact. This system will stimulate the effectiveness of resource use, innovations and more effective environmental protection.

The starting point for reforming might be the universally recognized and the most developed nature conservation legislation adopted by the European Community. Its key provisions considerably differ from the Russian legal norms. This law system to a large extent is the direct effect legislation. In contrast to the framework of our country this environmental law does not need additional interpretation by the acts of any authorities. Besides, the system covers practically all key issues of environmental protection and nature use. The most important thing is that EU norms are the result of a compromise equitable dialog among the public, government and business. Aligning of nature conservation legislations is necessary due to the coming membership of Russia in the WTO and due to the enforcement of the Kyoto Protocol.

Normative and methodical documents for implementing the BAT concept shall be based on a sectoral principle. And not only economic sectors are to be accounted for, but also their ability to pay and pollute the environment. The following elements are necessary are crucial for the use of BAT in Russia:

- adoption of law on the best available technologies;
- development of methods for comprehensive permits for nature use;
- changes in the Fiscal Code of Russia;
- identification and official approval of the "dirtiest" industries;
- establishment of an independent consultative body for protecting the interests of stakeholders;
- training of qualified specialists.

It is of principal importance to arrange a dialog between the government and business. Economic development and improvement of the investment climate are primarily hindered by big administrative barriers. In turn, the latter are determined by imperfect normative support of "government-to-business" relations, low information openness of authorities, critically low level of computerization of state services oriented to clients. All the factors listed above leads to the increase of costs of businesses for overcoming administrative barriers (including the increase of corruption), growing risks for commercial projects, reduction of investment attractiveness and value of business. The increased abuse of power by clerks and augmented "environmental" exactions created prerequisites for business to become more active and consolidate in struggling against this phenomenon (especially small and medium-sized business).

Even now large business is getting more interested in stable relations with environmental authorities. It can be determined by several reasons. First of all, private agreements with bureaucrats do not give long-term guarantees while large projects require individual attention from authorities, understanding of the challenges of business and constructive dialog with authorities. Stable relations with the representatives of the authorities might reduce investment risks. Secondly, representatives of large industrial enterprises are interested in switching to the system of technical norming; therefore, to the sectoral approach and understanding of challenges and prospects of the sector in terms of the environment (pers.comm. Zhukov). Authorities will not achieve results considerable for business and for the society without active involvement of business in the process of governmental reforms. Therefore, it is necessary to elaborate the mechanisms that allow making decisions influencing the increasing national competitiveness, security and living standards within the interactions between authorities and business.

Under the conditions of aggravating financial and economic situation, the industrial development of Russia and observance of the constitutional rights of people for favorable environment are possible only if companies stage by stage fulfill nature conservation requirements. The progress in this area can be secured only if technically achievable and environmentally and economically acceptable measures are taken with the account of the international experience of switching to the concept of the best available technologies. Not the stand is necessary here but cooperation between the industries and governmental nature conservation authorities and joint search for compromise and optimal solutions.

Environmental funds can be one of the auxiliary mechanisms for removing environmental damages. Environmental funds can be established at federal, regional, and local levels. The goal of the funds will be to solve urgent nature conservation goals, mending environmental losses, compensation of damages etc. The funds might be formed from the money coming from companies, i.e. payments for the negative environmental impact and disposal of wastes as well as the means received on the basis of claims on compensating harm and fees for environmental law violations. The environmental fund can become a reliable financial guarantee for nature conservation activities of enterprises. For instance, in case of temporary minimization of production due to the introduction of BAT the money of the fund can serve financial guarantee for both creditors and the government.

It is obvious that such changes will require significant corrections to the current environmental legislation. It is suggested that draft laws are produced that envisage the following:

- enhancement of environmental protection system, including environmental payments that motivate enterprises to modernize their key assets and use resource and energy saving technologies;

- transition from the practice of issuing temporary individual permits for excessive emissions and discharges to the system of technological norms for admissible environmental impact with the account for using the best available technologies;

- cancellation of overlapping permits in the area of protecting water resources (that include norms for admissible emissions, permits for emitting harmful substances, and decision on providing a water body for use).

It is indispensable to change the attitude to regulating nature conservation. The environment should be positioned not as a separate and isolated area of activities, but as an integral part of all activities: economy, city development, production, research, education etc. Administrative and economic methods of nature conservation activities management should be combined for securing effective environmental security. This should be reflected in introducing environmental incentives in the process of decision making at both the highest level and in private business.

# Bibliography


1. Alan , R.H. (1996). Coasian externality theory in a policy context. In P. Sauer & M. Livingston (editors.), *Environmental Economics and Policy: Selected Classical Readings*. Prague: University of Economics.

2. Analytical note to the project "Elimination of the past ecological damage in the Russian Federation. (2008). Federal Service of Ecological, Technological and Nuclear Control.

3. Application of the mechanism of the best available technologies in European practice of environmental management. (2006). Chamber of Commerce and Industry of Russia, Moscow.

4. Arkhangelsk Pulp and Paper Mill. (2008). *Nature conservation activities report*. Arkhangelsk, Russia.

5. Asafu-Adjaye, J. (2000). *Environmental Economics for Non-Economists* (p. 321). Singapore ; New Jersey: World Scientific.

6. Barde, J-P. (1995). Environmental Policy and Policy Instruments. In H. Folmer, J.L. Gabel, & H. Opschoor (editors), *Principles of Environmental and Resource Economics: A Guide for Students and Decision Makers.* Aldershot, UK: Edward Elgar.

7. Baumol, W. J., & Oates, W. E. (1996). The use of standards and prices for protection of the environment. In *Environmental Economics and Policy: Selected Classical Readings* (p. 224). Prague: University of Economics, Prague.

8. Bondarenko M.V.Economic methods of environmental protection for enterprises. Available at: http://www.ecoindustry.ru/showselectednumber/docs/viewdoc.html&id=303.

9. Braginskii, S. V., & IAvlinskii, G. (2000). *Incentives and Institutions: The Transition to a Market Economy in Russia* (p. 274). Princeton, N.J: Princeton University Press.

10. Budgetary report about the results and guidelines of activities of the Federal service on technological, ecological and atomic control. (2004). . Federal service on technological, ecological and atomic control, Moscow.

11. *Civil Code of the Russian Federation*. (1994). 51-FZ. Moscow: Code of Laws.

12. *Decree of Government of the Russian Federation on the Approval Order of Acceptable Waste and Microorganisms Dumping to Water Bodies for Water Users*. (2007). 469. Moscow: Code of Laws.

13. *Decree of the Government of the Russian Federation on Standards of Harmful (Polluting) Substances Emissions into Ambient Air and Harmful Physical Impact on It*. (2000). 183. Moscow: Code of Laws.

14. *Decree of the Government of the Russian Federation on the approval of the Procedure for Defining the Payment and Its Ultimate Amount for the Pollution of the Environment, for the Placement of Wastes and for the Other Kinds of a Harmful Impact*. (1992). 632. Moscow: Collection of legal acts the President and the Government of the Russian Federation.

15. *Decree of the Government of the Russian Federation on the Standard Amounts of Payments for Polluting the Atmospheric Air by Stationary and Mobily Sources, Emissions of Pollutants into the Surface and Subsurface Water Bodies, for the Disposal of Industrial and Domestic Waste*. (2003). 344. Moscow: Code of Laws.

16. *Decree of the Russian Federation Government on Rules of Elaboration and Certification of Waste Formation and Limits on Its Placing Standards.* (2000). 461. Moscow: Code of laws of Russia, 2000. #26. p.2772.

17. *Decree of the Russian Federation Government on the Order of Ratification of Admissible Water Bodies Impact Standards*. (2006). 881. Moscow: Code of laws of Russia, 2007. #4. p.514.

18. Denzin, N. (1978). *Sociological Methods: A Sourcebook*. NY: McGraw Hill, 2nd ed.

19. Department of economics of nature use. (2005). Proceeding about reforming of legislation in a field of environmental payment. Ministry of economic development and trade of Russia, Moscow.

20. *Development of legal base in a field of rational nature use and environmental protection*. (2006). Moscow: Report of the conference "Sustainable development. The system: nature-society-man". Available at: http://council.gov.ru/files/journalsf/item/20070420112835.pdf.

21. Directive 2008/1/EC of the European Parliament and of theCouncil concerning integrated pollution prevention and control. (2008, January 29). . Official Journal of the European Union. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:024:0008:0029:EN:PDF.

22. Doby, J. T. (1967). *An Introduction to Social Research*. ACC sociology series (2nd ed., p. 381). New York: Appleton-Century-Crofts.

23. Ecological Committee of the State Duma of Russia. (2005). Explanatory Note on the draft of the Law on environmental payment. State Duma, Moscow.

24. Elgar E. (1999). *The Market and the Environment: The Effectiveness of Market Based Policy Instruments for Environmental Reform*. UK: Cheltenham.

25. Environmental Protection Act 86/2000. (2000, February 4). Ministry of the Environment, Finland.

26. *Environmental report of Gazprom*. (2007). Moscow: Gazprom. Available at: http://www.gazprom.ru/documents/Ecology_Rus_2007.pdf.

27. Environmental Supervision of and Preparation for the Olympic Games. (2009, April 3). *Ministry of natural resources and ecology of Russia*. Available at: http://www.mnr.gov.ru/part/?act=print&id=5642&pid=11.

28. Esterberg, K. G. (2002). *Qualitative Methods in Social Research* (стр-а. 256). Boston: McGraw-Hill.

29. Explanatory note to draft decree of the Government of the Russian Federation "Approval of Procedures for providing and spending resources obtained during the implementation of the Russian Program of organizing investments in improving the environment. (2006). Ministry of economic development and trade of Russia, Moscow.

30. Explanatory note to the legal draft of Governmental Decree on rates of environmental payment for polluting emissions and waste disposal. (2005). Ministry of economic development and trade of Russia, Moscow.

31. Federal Law on environmental protection. (2002, Январь 10). Moscow: Rossiyskaya gazeta, 188. 31/08/2004.

32. *Federal law on fauna*. (1995). 52-FZ. Moscow: Code of laws of Russia, 1995.#17. p.1462.

33. *Federal Law on Technical Regulation*. (2002). 184-FZ. Moscow: Code of Laws.

34. Fedotova M.E. (2006). Review of environmental economic instruments in Russia and Sweden. Working Paper presented at the international conference "Role of the environmental administration for sustainable functioning and development of ecosystems". Moscow: Moscow State University of

Nature Management System. Available at: http://www.msuee.ru/science/1/sb-06.files/2_84_sb_06.html.

35. Field, B. C., & Field, M. K. (2006). *Environmental Economics: An Introduction* (4th ed., p.503). Boston, Mass: McGraw-Hill.

36. GIOŚ Poland. (2001). The quality of environment in Poland – new challenges and lessons learned. Available at: http://www.kul.lublin.pl/kos/techne/pl_1.pdf.

37. Girusov E.V. (1998). Ecology and economy of nature use. *Zakon I pravo*, (YUNITI. Moscow).

38. Golub A.A, & Strukova E.B. (1993). Economic methods of environmental management, ("Nauka", Moscow).

39. GOST R 17.0.0.06-2000. (2001). *Nature protection. Ecological passport of nature user*. Moscow: Publishing house of standards.

40. Governmental Decision on the Concept of Federal law on payment for environmental pollution. (2005, Mapr 3). . Government of the Russian Federation.

41. *Governmental Decree on Amendments in the Appendix 1 to Governmental Decree on Rates of environmental payment*. (2005). 410. Moscow: Government of the Russian Federation.

42. *Governmental Decree on Approval of the procedure of payment calculation for environmental pollution, waste distribution and other types of negative impacts*. (1992). 632. Moscow: Government of the Russian Federation.

43. *Governmental Decree on Rates of environmental payment*. (2003). 344. Moscow: Government of the Russian Federation.

44. Gudkov, A. (2008, Mapr 14). Ministry of Nature will Protect Nature with RUR. *Kommersant, Russia*.

45. Gudkov, A. (2008, March 14). Ministry of Nature will Protect Nature with RUR. *Kommersant, Russia*.

46. Hanley, N., Shogren, J. F., & White, B. (2001). *Introduction to Environmental Economics* (p.350). Oxford: Oxford University Press.

47. *Improvement of the Russian system of environmental permissions for industries. Harmonization of environmental legal bases, Russia*. (2003). . Moscow: TACIS.

48. Inter-Agency Comission of the Russian Federation on climate change. (2002). *Third national communication of the Russian Federation*. Moscow.

49. Inter-agency commission of Russia on climate change. (2002). Third national communication of the Russian Federation. *UNFCCC*. Available at: http://unfccc.int/resource/docs/natc/rusnce3.pdf.

50. Karev V.V. (2006). Enhancement of the taxation system in the area of water industry. Moscow: Moscow State University of Natural Development.

51. Kasjanov P.V. (2001). Economic and institutional bases for reforming management of nature use for transferring to sustainable development. Moscow: Abstract of Doctoral dissertation.

52. Kaveshnikov N.T. (2006). Theoretical approaches to the economical evaluation of natural resources. Moscow: Moscow State University of Natural Development.

53. Klarer J., Fransis P., MakNikolas D., & Golub A.A. (1999). *Environemntal protection and economic development: Potential of economic instruments for improvement of the quality of environment and sustainable development in countries with economy in transition*. Szent-Andre, Hungary: Regional Environmental Center.

54. Krasnova, I. (2008). "Euroremont" of Russian legislation. Harmonization of legals bases in a field of environmental protection, (Ecology and life, Russia). Available at: http://www.ecolife.ru/jornal/econ/2004-5-1.shtml.

55. Kuvshinova, O. (2008, March 14). Flexible tariff. *Vedomosti, Moscow*

56. Laffont, J. (2000). *Incentives and Political Economy*. Clarendon lectures in economics (p. 257). Oxford: Oxford University Press.

57. *Land Code of the Russian Federation*. (2001). Moscow: Code of laws of Russia, 2001.#44.p.4147.

58. Mondi Group. (2008). *Sustainability summary report 2008*. Mondi. Available at: http://www.mondigroup.com/ru/PortalData/1/Resources/sustainability/reports/SD_Summary_ReportLoRes.pdf.

59. Monitoring of the current economic situation in Russian Federation for the period January-November 2007. (2007). Ministry of Economic development and Trade, Moscow.

60. Neuendorf, K. A. (2002). *The Content Analysis Guidebook* (p. 301). Thousand Oaks, Calif: Sage Publications.

61. Norton , G. (1984). *Resource economics*. London: Edward Arnold.

62. *Order of the Ministry of Natural Resources and Ecology of Russia on Methodology of elaboration of acceptable waste and microorganisms dumping to water bodies for water users standards*. (2007). 333. Moscow: Ministry of natural resources of Russia.

63. *Order of the Ministry of Natural Resources of Russia on Approval of Temporary Procedures for Issuing Licenses for Comprehensive Nature Use*. (1993). 273. Moscow: Ministry of natural resources of Russia.

64. Pakhomova N.V. (2005). The Concept of the hierarchy of property rights for natural resources. *2*, 5, (Works of Saint-Petersburg University).

65. Pigou , A. (1920). *The Economics of welfare*. London: Macmillan.

66. Poussenkova, N., & Solntseva, E. (2007). Russian companies in 21st century: towards competitive corporate citizenship. Survey by Program on trade and investments. Moscow: WWF Russia.

67. Proposal on Improvement of Standardization in the Area of Environmental Protection. (2008). . Ministry of natural resources and ecology of Russia, Moscow.

68. Recommendations of Parliamentary hearing “Challenges of legislative support to environmental protection when using natural resources”. (2008, March 27). . Council of Federation of Russia, Moscow. Извлечено от http://council.gov.ru/kom_home/kom_prirres/meropr/item179.html.

69. Resolution of the Board of Russian Technological Surveillance referring to the improvement of activities insuring ecological security, prevention of negative influence of enterprises on the environment and elimination of ecological damage. (2008). . Federal Service of Ecological, Technological and Nuclear Control.

70. Resolution of the extended meeting of the Committees of the Chamber of Commerce of the Russian Federation. Discussion of the draft federal law «Payment for negative environmental impact». (2007). Moscow: Chamber of Commerce and Industry of Russia, Moscow.

71. Size of the payment for water pollution will increase twice in 2009, from 2014 – 10 times. (2008, September 9). *Prime-Tass*. Available at: http://www.prime-tass.ru/news/show.asp?id=816170&ct=news.

72. Söderholm , P. (2004). Extending the Environmental Tax Base: Prerequisites for Increased taxation of Natural Recourses and Chemical Compounds. Swedish Environmental Protection Agency.

73. *Tax Code of the Russian Federation*. (1998). Moscow: Code of laws of Russia, 1998. #31. p. 3824.

74. *The Market and the Environment: The Effectiveness of Market Based Policy Instruments for Environmental Reform*. (1999). International studies in environmental policy making (p. 488). Cheltenham, UK: E. Elgar.

75. Turner, R. K., Bateman, I., & Pearce, D. W. (1994). *Environmental Economics: An Elementary Introduction* (p. 328). Hemel Hempstead, Hertfordshire: Harvester Wheatsheaf.

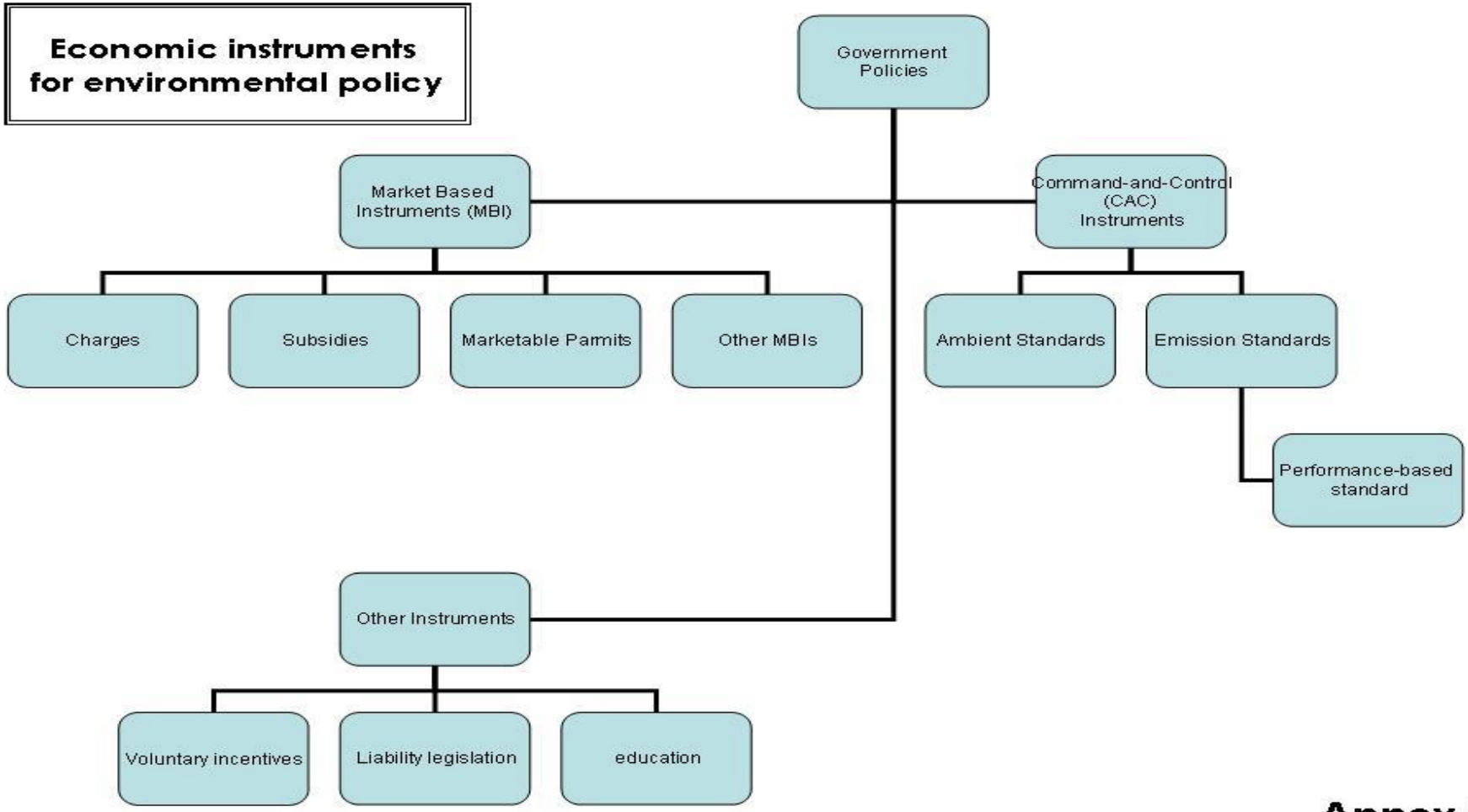
76. Verhagen, H.J. (1998). Policy Analysis Methodology. Varna, Bulgaria: Seminar on Environmental Aspects of Black Sea Ports.

77. *Water Code of the Russian Federation*. (2006). Moscow: Code of laws of Russia, 2006. #23. p.2381.

78. Zhilin Oleg. (2009, April 14). Incidental does not mean worthless. *Internet version of newspaper "Nezavisimaya"*. Available at: http://www.ng.ru/printed/224956.

79. Zhurbin V.J. (2007). Formation of integrated systems for environmental and economic management in construction. Moscow: Copyright. Abstract.

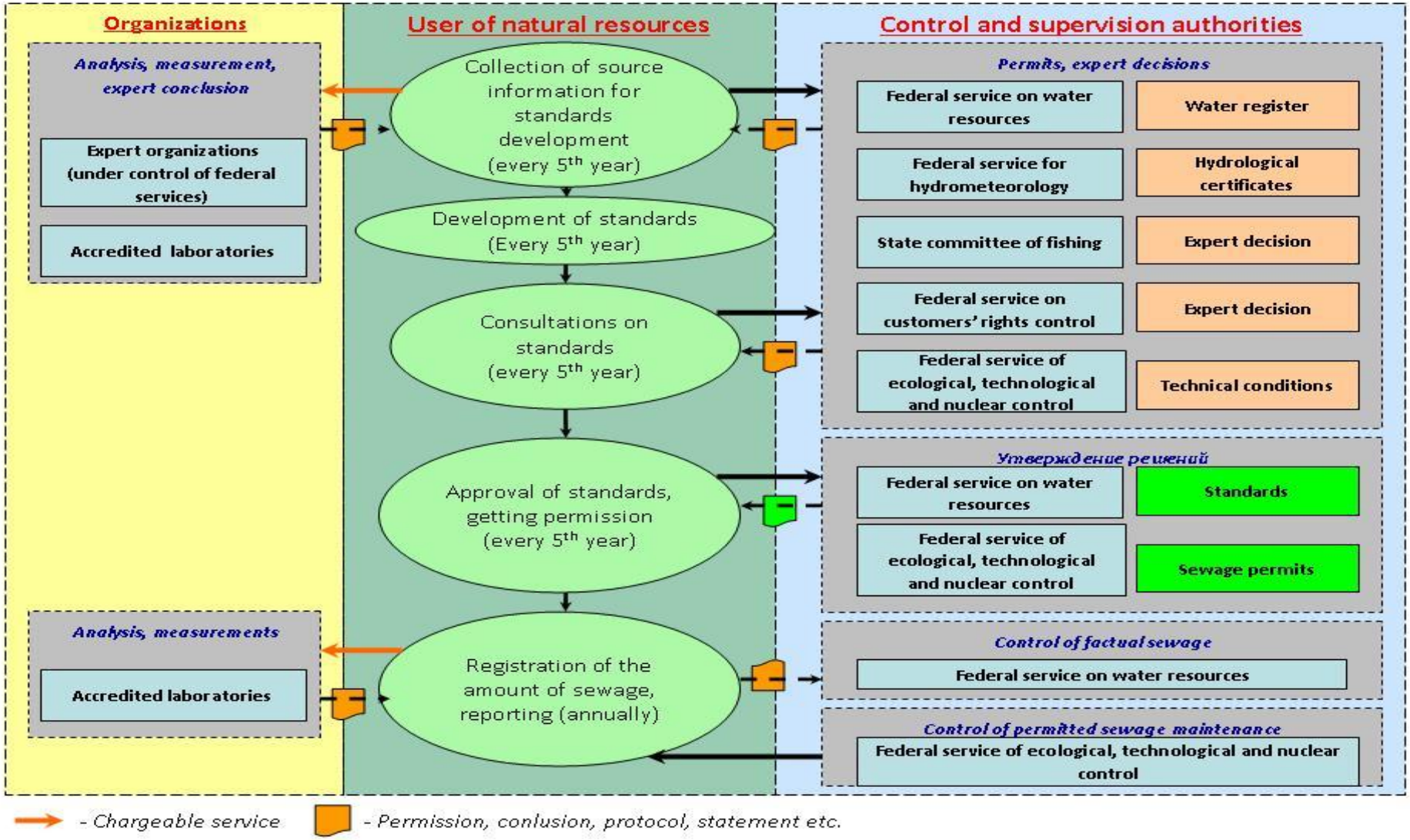
# Appendix


Economic instruments for environmental policy
Government Policies
Market Based Instruments (MBI)
Command-and-Control (CAC) Instruments
Charges
Subsidies
Marketable Permits
Other MBIs
Ambient Standards
Emission Standards
Performance-based standard
Other Instruments
Voluntary incentives
Liability legislation
education

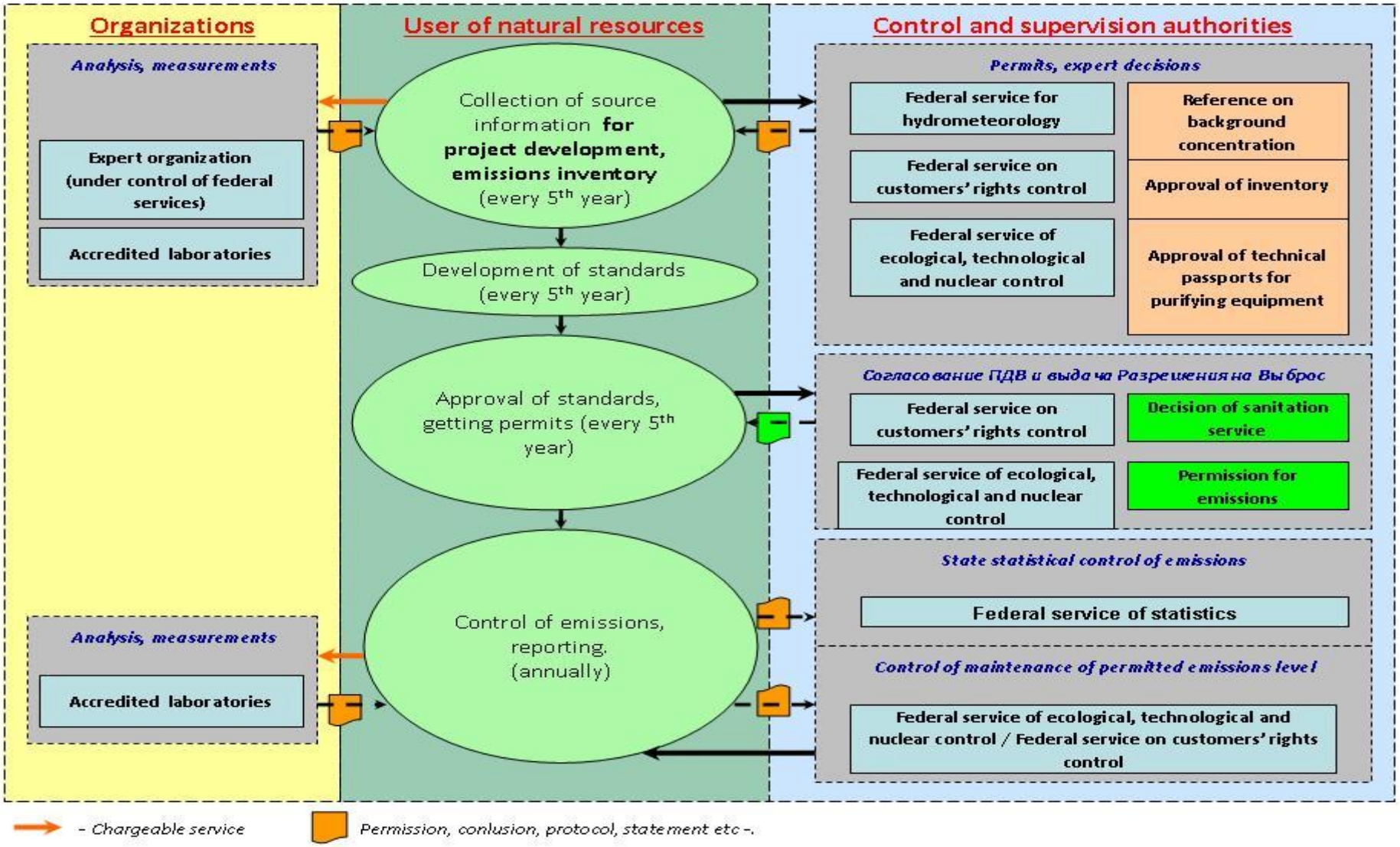
**Annex 1**

# Actual System of Water Sewage Permits

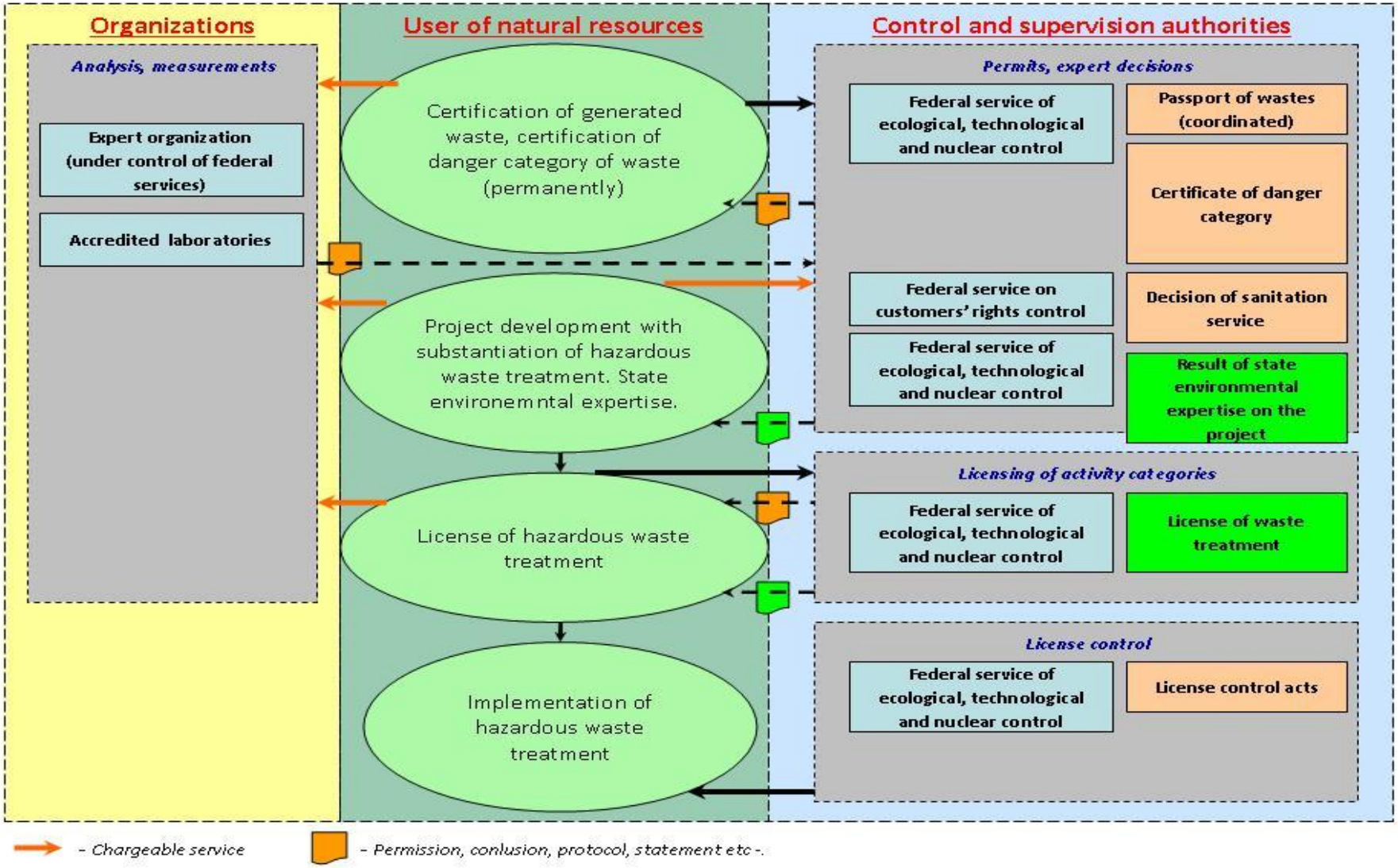
Annex 2



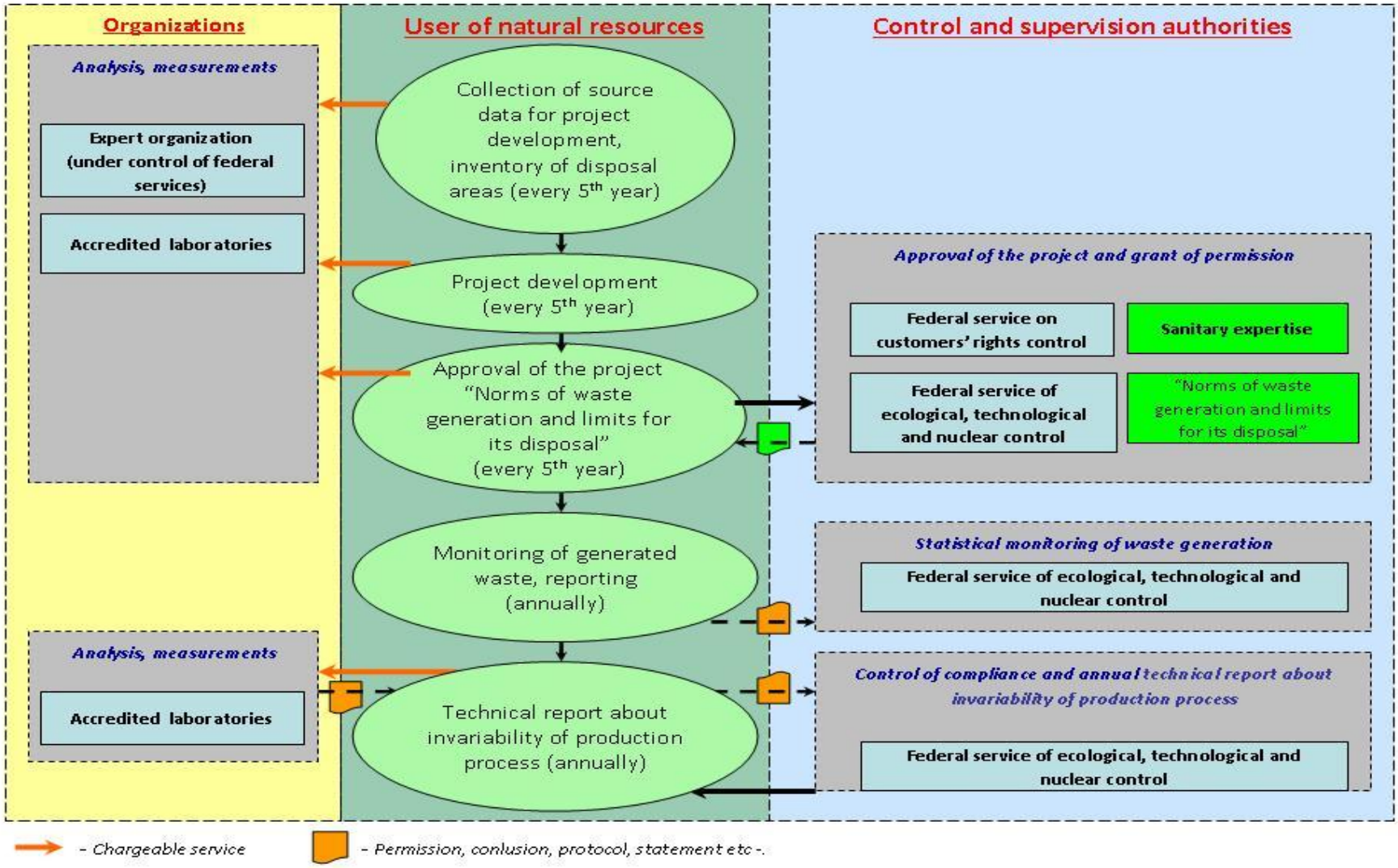
# Actual System of Emissions Permits



# Actual System of Permits for Waste Disposal - 1



# Actual System of Permits for Waste Disposal - 2



## Annex 3

# Framework for unstructured interviews

Interviews with representatives of governmental bodies

1. What economic instruments adopted by the acting Russian legislation you can consider as efficient?

2. What economic instruments stimulate enterprises to implement environmental activities according to the law and in practice?

3. What are shortcomings of the current system of economic instruments in particular of the system of environmental payment in Russia?

4. What would be more efficient, modernization of the existing economic instruments to increase its stimulative factor or introduction of new instruments/measures? What instrument could it be?

5. What environmental practices in a field of environmental incentives used in developed countries can be applied to the Russian conditions?

Interviews with representatives of industrial sector

1. What economic instruments adopted by the Russian legislation touch upon the field of your enterprise?

2. What economic instruments that are actively used by your enterprise you can define as stimulative for the implementation of environmental activities?

3. What is percentage of the budget of you enterprise allocated annually for:

- environmental payment;

- implementation of environmental activities.

4. What are shortcomings of the current system of economic instruments in particular of the system of environmental payment in Russia?

5. What kind of changes in acting environmental legislation could stimulate your enterprise for implementation of activities in a field of environmental protection?