



## ECOLOGY AND ECONOMY

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## ON ANTI-SUSTAINABLE TRENDS IN RUSSIA'S ECONOMY DEVELOPMENT

Today in Russia a situation has been formed when a degradation of numerous capital components occurs, and, correspondingly, the probability of a depletion of aggregative capital is high. Due to this fact the stability criterion is not met. This conclusion is substantiated by World Bank estimates of the adjusted net savings rate (real savings) which in recent years has been negative in Russia<sup>1</sup>. The following factors also testify to "anti-sustainable" trends in the country's development:

- increase in environmental pollution's affect on public health;
- structural shifts in the economy increasing the specific weight of industries exploiting the nature and polluting the environment;
- high levels of natural exploitation rates, their growth as compared to pre-reform years;
- negative dynamics and micro-economic rates based also on the environmental factor;
- investment policy that is environmentally unbalanced and results in a growth in disproportionality between nature exploiting, processing, manufacturing and infrastructural industries;
- high levels of depreciation of fixed assets;
- undercount of the economic value of natural resources and services;
- exports are based mostly on natural resources.

Levels of environmental pollution and life improvement have a significant effect on the cardinal parameter of human development, human health and life span, the human capital as a whole. In general, a critical problem for the human capital in Russia is the catastrophically low life expectancy (as compared to developed countries and countries in transition) which is especially low among men, and the high mortality rate among people of the active working age. The environmental factor makes a sufficiently large contribution into this unfavorable situation. As of today, more than 60 million people live in regions where the environmental situation is unfavorable and which occupy 15 per cent of the country's area. In 146 cities and towns air pollution rates are estimated as high or very high.

Pollution of water resources also contributes to the deterioration of public health. The sanitary state of water supply sources is unsatisfactory. Nationwide 30 per cent of water samples collected from surface water sources fail to meet chemical, and 25 per cent—biological criteria of hygiene. The principal problems here are the low efficiency of water treatment and the high degree of water-supply structure depreciation (over 60 to 70 per cent).

Basing on health risk assessments, Moscow State University experts have calculated economic costs for public health in Russia caused by the pollution of air and water.

In particularly environmentally polluted regions (specifically in the Sverdlovsk and Chelyabinsk Oblasts) economic losses due to air pollution go as high as 8 per cent of the gross regional product (GRP) which significantly exceeds its growth in these regions. These estimates were performed basing on the Ecosense model widely used in European Community counties. The model only took into account health damage caused by air pollution.

**Today in Russia certain trends are being formed that promote the formation of an "anti-sustainable" type of development. Numerous criteria of sustainable development have been developed in the world. One of most popular theoretical approaches is the criterion of sustainability that requires maintaining/increasing with time of the aggregate national capital comprising three types of capital: human, physical (equipment, buildings, etc.) and natural.**

<sup>1</sup> See World Development Indicators. The World Bank, Washington DC, 1999-2006.

It is evident that in many of the country's regions water pollution presents a burning problem to the local populace. On the basis of available studies it can be assumed that water pollution accounts for 1 to 2 percent GRP losses in terms of public health damage estimated as shown above. Therefore, aggregate health damage due to environmental causes (water and air pollution) can amount to 10 per cent GRP. This has been demonstrated, particularly, for the Urals regions.

The future can present new health problems. For example, power producers intend to carry out a restructuring of the fuel and energy balance by means of reducing supplies of natural gas for domestic electric power generation, and expanding the use of coal and fuel oil instead. As is well known, products of coal combustion are 10 to 50 times, and of fuel oil—3 times as toxic as the products of gas combustion. There is no doubt that this will increase air pollution in urban areas causing an increase in sickness and mortality rates.

The formation of non-sustainable trends in Russia's development is in many aspects associated with the undercount of the environmental factor in the micro-economic policy, which results in further degradation of the environment and the depletion of natural resources. The economic upturn that has begun can aggravate these processes even more. This can be clearly noticed in the changes of the physical capital. Two aspects of the problem can be singled out here:

- direct degradation of the physical capital;
- decrease in the "environmental quality" of the physical capital.

The former aspect is characterized by a worsening of the age structure of productive assets, their mass ageing and, as a consequence, an increase in the number of environmental accidents and catastrophes. Aged equipment is slowly replaced with new one due to insufficient investments—today in many branches the degree of equipment depreciation amounts to 50 to 70 per cent. The worsening of the "environmental quality" of the physical capital is characterized by the weighting of the structure of the economy environment-wise. This is associated with more nature-consuming restructuring of the economy in the 90's, when a shift was made towards raw materials-producing and environment-polluting sectors, with resource-saving and high-tech industrial facilities degrading. There occurred a general significant shift towards nature-consuming industries in the economy. The Russian economy has been increasingly becoming an economy based on raw materials, the "pipe economy".

Today the problem of the depletion of the natural capital of the country is widely discussed. We shall only note that the "Long-Term State Program for the Study of Subsoil and Reproduction of Minerals and Raw Materials Base of Russia on the Basis of Consumption and Reproduction Balance base up to 2020" developed by the Russian Ministry of Natural Resources in 2004 contains rather pessimistic assessments of the actual wealth of our "natural storehouse". The time of full

exhaustion of payable resources of numerous raw materials is drawing near: oil, uranium, copper, and vein gold resources that the country possesses will be exhausted in 2015. Resources of raw materials (most important, those of oil and gas) in the Volga-Urals and Western-Siberian are going to run out soon. Thus, in the principal oil-and-gas bearing provinces in the Northern Caucasus the rate of oil and gas depletion amounts to 70 to 80 per cent, in the Urals and Volga regions—50 to 70 per cent, and in the Western Siberia—over 45 per cent.

Transition to sustainable development makes it necessary to include the environmental factor into the system of basic socio-economic indicators of a country's development. The fact that the environmental factor has been insufficiently taken into account in the decision-making process is associated with the fact that traditional development indicators do not take into account the value of the natural capital and the costs of environmental degradation. Traditional macro-economic indicators that are in use in this area today (GNP, per capita income, etc.) ignore environmental degradation. Today's growth of these indicators is based on a nature consuming development whose anthropogenic impact on the environment is severe. This creates a possibility for a sharp decline in economic indicators in the future due to the depletion of natural resources and environmental pollution.

Criteria and indicators of sustainable development are being actively developed internationally, and systems of such indicators often happen to be fairly complex. The following international organizations are involved in this work: the UN (a system of integrated environmental and economic accounting), the World Bank (the genuine savings index), the OECD (a system of environmental indicators), the EC (GARP1, GARP2, and TEPI projects), and others. The principal point in these efforts is an attempt at taking into account the damage incurred by environmental pollution and the depletion of natural resource at the macroeconomic level, at adjusting the basic economic indicators of a country's development with the environment in mind.

For example, the World Bank has published its estimates based on the methodology of adjusted net savings (genuine savings), that for all countries in the world showed a significant discrepancy between traditional and environmentally adjusted economic indicators. As noted above, in Russia over all recent years the adjusted net savings rate has been negative, whereas the GDP has grown. It is important to take this into account in the conditions of an economic upturn in Russia.

In order to implement a scenario that would enable a transition to sustainable development, the existing type of development shall be radically changed, its paradigm altered, and "anti-sustainable" trends in the economy shall be overcome. Today various definitions of the new type of economy exist: postindustrial economy, knowledge-based economy (most widely-used

definition), innovative economy, science-intensive economy, information-based economy, sustainable economy, etc. Regardless of the formal definition, the transition shall be based on priority development of the human capital, knowledge and information, profound structural and technological changes.

Over the last 3 or 4 years the President of the Russian Federation and the RF Government officials have repeatedly stressed the need to depart from the raw materials-based development of the Russian economy, diversify the economy and to accomplish a transition to an innovative type of development. All recent concepts, strategies and programs of the Russian Government are oriented at a new type of the country's development. However, so far there has been no success in overcoming anti-sustainable trends.

A structural and technological restructuring of the economy has a colossal potential for a transition to an environmentally and economically stable growth. Such restructuring can result in an efficient resource-saving and reduce environmental pollution. A structural and technological rationalization of the economy can release up to a half of resources currently used inefficiently, with a simultaneous increase in the final output and a significantly reduce levels of released pollutants. Improvements in the use of natural and raw materials can result in a significant reduction in the amounts of produced energy resources and raw materials, and reduce areas of their production, territories used for agriculture, felling of forests, etc., due to a better use and a deeper processing of natural resources and raw materials, and significantly improve the well-being of the people. For example, the "Energy Strategy of Russia up to 2002" program (2003) says that a wide use of simple enough energy-saving technologies can result in saving almost half of presently consumed energy.

In view of the above a question arises: is it really necessary to expand an extensive use of natural resources in order to achieve an economic growth? It's evident that Russia can increase its GDP two- or three-fold even at the current level of resource consumption.

Naturally, in current socio-economic situation in the country it would be naive to demand an artificial reduction of growth rates in those industries that consume natural resources (the energy industry in the first place). However, the efficiency of these industries shall be improved.

Within the framework of the scenario of a transition to a sustainable development an environmentally expedient decrease in the share of natural resources in the structure of the country's export doesn't mean that the country will automatically lose some of the benefits resulting from the use of its natural capital, of its natural advantages. The directions of the restructuring of the country's economy, specifically the increase in the share of processing and manufacturing sectors can

bring additional tens of million dollars from the export of product with a deeper level of processing of raw materials, and with a bigger added value.

Estimates show that a deeper processing of raw materials ensures that the added value increases two to ten times, e.g. the value of raw oil converted into petroleum products, increases six to ten times, that of timber turned into construction materials—four to six times, etc.<sup>1</sup> Companies utilizing natural resources shall be encouraged or even forced not to increase production but diversify, deepen processing, invest money not in the initial stage of the nature-to-product process, but in the middle and final stages of the whole process, they shall build new processing enterprises, quickly expand the introduction of innovative technologies. This approach won't reduce the companies' profits—it will result in their growth and improve the economic stability of these enterprises.

Transition to sustainable development calls for strengthening environmental priorities in the state policy. In the case of Russia the following important directions of restructuring can be singled out that can, directly or indirectly, reduce environmental loads and increase the efficiency of the use of natural resources:

- development and adoption of a long-term strategy of the environmentally sustainable development of the Russian Federation;
- removal of environmental threats to human health;
- environmentally balanced restructuring of the economy, support of innovative development and formation of a knowledge-based economy;
- environmental adjustment of traditional development indicators; a valid evaluation of natural resources and services, and environmental losses in economic indicators during economic decision making at macro and micro levels;
- establishment of environmentally favorable systems of taxes, credits, subsidies, trade tariffs and duties;
- a significant decrease in the consumption of natural resources and pollutant releases per final product unit (at the macrolevel—per a GDP unit), expressed in smaller values of the indicators of the consumption of natural resources;
- an increase in the efficiency of production, and a differentiation of the system of payments for the use of natural resources that would promote the collection of such payments;
- introduction of changes into export policy aimed at reducing the share of natural resource with the increase of the share of high-tech science-intensive products and goods with a high share of added value.

<sup>1</sup> Spartak, N.A., *Russia in the International Division of Labor: Selecting a Competitive Strategy*, Moscow: MAKS Publ., 2004, p. 324.

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## PROBLEMS OF RUSSIA'S ENVIRONMENTAL INNOVATIVE DEVELOPMENT

Creation of a mechanism for environmental innovative activities is an important environmental economic tool for the promotion of sustainable development in today's conditions. Environmental protection is an integral part of ecological programs (plans) of enterprises. Over recent years many Russian enterprises have been actively introducing environmental management systems in accordance with the requirements of the ISO 14001 international standard, which is explained by the possible Russia's joining the WTO and a shift of priorities towards international sales of environmental goods. For enterprises that have created and introduced a system complying with the ISO-14001 international standard, formation of an environmental program is one of the principal requirements ensuring efficient functioning of an environmental protection management system. When such system is being developed, long-term directions of the enterprise development, its strategy, environmental policy and priority environmental aspects are taken into account. The singling out of priority (significant) environmental aspects permits, first of all, to concentrate on the development of measures aimed at reducing the number of environmental violations, and work out restorative and compensatory measures on the liquidation and mitigation of such violations. Such environmental program (plan) provides for expenditures aimed at reducing adverse environmental impacts. Environmental program fulfillment indicators reflect how efficiently the program is implemented. Priorities expressed in quantitative indicators and innovation-oriented, shall be set for each specific stage of the implementation of an environmental program. Introduction of an environmental protection management system in accordance with ISO-14001 requirements at an enterprise allows it to decrease consumption of natural resources (water, energy, raw materials, etc.) and sums of payments.

Significance of environmental standardization lies in the implementation of the Deming Principle applied to a continuous reduction of an enterprise's environmental impact. Otherwise, after an inspection of the enterprise's ecological management system, the enterprise may be deprived of ISO-14001 certificate of conformance. In brief, this principle can be formulated as "Plan-Act-Inspect-Correct". By the beginning of 2006 about 200 Russian enterprises had been certified as complying with this standard, whereas abroad there are over 40 thousand entities possessing the environmental certificate, over 17 thousand in Japan, 4 thousand in the USA, 2.5 thousand in India.

In developed countries small business is an important conductor of innovative ideas. In the sphere of environmental protection business plays the leading role in decision-making regarding the practice of environmental protection, because it's the business that supplies products to the environmental protection goods, work and services market. All types of the activity of the environment-oriented small business, without exception, can be regarded as innovations of environmental protection nature, as they all are aimed at an environmentally stable development. In general, so far Russian small business is dominated by enterprises creating relatively insignificant added value, i.e. trade, catering, etc., whereas science and technologies development "close the list." This makes environment-oriented small business different from small business in gen-

**The efficiency of overcoming problems of environmental innovative development in Russia depends on its economic and institutional support in the areas of the spreading of international ecological standardization, creation of favorable conditions for the development of environment-oriented small business, and introducing changes into the state environmental policy.**

eral. Among the types of activity of environment-oriented small business the following types shall be singled out: marketing services aimed at studying the needs of natural resources consumers in environmental protection equipment, instruments, materials and other equipment and supplies; control instrumentation and other environmental protection equipment installation, maintenance and repair services; waste treatment services, including the reclamation of polluted land; services associated with the carrying out of environmental impact assessments, environmental expert reviews, environmental standardization and environmental economic auditing; environmental education, training and advanced training of personnel.

In accordance with current tax legislation, business entities licensed to perform environmental protection-related activities, have been made equal with all other types of business activities, enterprises and organizations of all forms of ownership. This clearly contradicts Article 17 of the Federal Law "On Environmental Protection" (2002) on tax remissions. Besides, the forced pricing of the products and services offered by Russian environment-oriented small business based on the "customer's preparedness to pay" contradicts the fact that foreign companies offering environment-oriented services establish prices that are much higher than those of their Russian counterparts, and quite often it happens that their technological capabilities do not meet the requirements of Russian state regulators.

Support of environment-oriented small business can be provided both in the form of specific actions and on the basis of cardinal reforms having to do with economy "environmentalization" in general on the path of the transition to sustainable development. Integration of Russia into the team of economically developed countries shall be accompanied with a rise in environmental responsibility existing in these states, by means of increasing the effectiveness of legislation. This shall lead to a rise in the demand for the products and services offered by Russian environment-oriented small business, and this, in turn, will make prices depend on the demand, instead of the "customer's preparedness to pay."

Cardinal reforms associated with the environmentalization of taxing<sup>1</sup> shall have an immediate effect on an enterprise's commercial efficiency, promoting the introduction of environmental protection technologies. This reform will effectively turn any small enterprises whose activities can potentially produce an impact on the environment into environment-oriented enterprises. However, if Russia doesn't implement the principle of environmental responsibility, it is bound to have a hard time trying to become one of economically strong world powers. Economic and institutional difficulties

of the formation of environment-oriented small business and economic and institutional support of such business are presented in detail in a work by Boboshko et al., 2006<sup>2</sup>. One of the institutional difficulties is the fact that environmental protection and environmental policy in general today are not among real priorities of supreme state authorities and administration bodies.

It should be also noted that existing payments for environmental pollution are significantly smaller than actual environmental damage, and current adjustment for inflation of these payments fails to keep up with inflation rates. Judging by recommended procedures for calculating adjustment ratios one can suppose that the principal specific weight in the process of payments utilization is associated with the dynamics of the commissioning of environmental protection entities. According to the Russian statistical agency Rosstat, the price index in capital construction in 2005 to 2004 was 3.1 per cent, whereas payments were adjusted by 1.09 per cent. This means that over this period the rate of payments adjustment is 2.8 times slower than that of price growth in capital construction. Therefore, one can say that the environmental protection investment ruble has become "thinner". This confirms that the state environmental policy is not of a high priority, because had it been otherwise, there would be more means available for financing eco-innovative activities. Including the sphere of environmental protection into the list of priority national projects would be a real breakthrough.

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<sup>1</sup> Gusev, A.A., Current Economic Issues of Nature Management, Moscow: Mezhdunarodnye Otnosheniya Publ., 2004.

<sup>2</sup> Boboshko, V.I., Gusev, A.A., Potravny, I.M., Aspects of Ecologically-Oriented Small Business in Russia, in Nature Management Economics, 2006, No. 5.

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## LONG-TERM SOCIO-ECONOMIC PROGNOSIS AS A PREREQUISITE FOR THE ENVIRONMENTALIZATION OF ECONOMY DEVELOPMENT POLICY

Within the framework of simplified predictive and analytical speculations the multi-dimensional, multi-faceted process of socio-economic development (it would be more accurate to call it "socio-economic evolution", as the term "development" term a priori implies that changes taking place are of a positive nature, which doesn't always correspond to the results of an analysis of actual changes based on various criteria!) is reduced to economic growth evaluated by a "one-dimensional", aggregate indicator.

With this approach economic development is viewed as a phenomenon similar to a long-distance running event, when the runner has to cover an indefinitely long distance as fast as possible. With the distance and the finish line not specified (i.e. when meaningful reference points of the development have not been formulated), the speed of the motion, i.e. growth rates come to the foreground becoming important (and sometimes all-sufficient) indicators of the runner's success. In real life, however, both at the common level and the level of the analysis of the processes of socio-economic development speed (rate) are hardly more important than a proper choice of the objective and the direction, of a specific route (i.e. development aims and desirable trajectory), of basic development factors (chance, short-term or controlled, possessing small or strategic potential) and the ways to systematically integrate them in a mechanism in motion (the policy of mobilizing the economic potential of the factors for achieving development aims).

Equating economic growth and development can be as erroneous as reducing a wide specter of indicators characterizing the multi-faceted process of a child's growth to just one, the dynamics of the child's weight. At the initial stage of a child's life the dynamics of his/her weight may be used as a fairly representative variable, and monitoring thereof a source of important information regarding the child's development processes, but as the child leaves infancy behind, weight growth, due to objective reasons, goes to the background, and in the case of an adult weight dynamics does not correlate positively with other parameters of man's development, but, more probably, negatively. Drawing an analogy here, for a "young" economy (e.g. a new industry, commodities or services market) high growth rates of "physical" production volumes are a sufficient indicator of its economic health. However, after a certain level of demand satisfaction has been reached, parameters of the economic health of a specific object get to be based on the tempo of qualitative changes, processes of technological and institutional modernization, which, as a rule, are not correctly presented in the dynamics of production volumes.

The tendency of making growth rates of aggregate macroeconomic indices the ultimate development index is naturally overcome in long-term prognosis studies that view economic development as the change of situation in a multi-dimensional socio-economic space that has numerous other dimensions, besides purely economic (e.g. demographic—life span of an average citizen, trends of changes in birth and mortality rates; environmental—changes of the environment; medical and demographic—integrated parameters of human health; geo-economic—changes in the country's place in the international economic system).

**Long-term socio-economic prognostics objectively promotes the expansion of a substantive context for the studies of national economy development processes, and the spread of a humanistic approach to the assessment of its results, asserting that the criteria of social, demographic and environmental well-being shall increasingly become of greater importance.**



In the context of long-term forecasting economic development and economic growth as its reflection are seen not as a "vicious infinity" of the buildup of production volumes and growing consumption, but as a regular change of objectives, factors, resource limitations, operating mechanisms, types of welfare, etc. This means that the concept of socio-economic development shall establish as its objective not a straightforward maximization of economic growth rates, but achieving high rates of actual approach to a preferable image of the future with the orientation at the subset of the most important, priority characteristics, the movement towards new qualitative results.

Therefore, instead of the problem of the transition to an "anonymous" economic growth (with uncertain mechanisms and blurred aims), the long-term prognosis sets the task of the substantiation of such economic policy that would form necessary and sufficient conditions for a preferable socio-economic evolution. Within the framework of an appropriate scenario GDP growth rates (or any other macroeconomic indicator) will be a natural consequence of particular features of the economic policy variant realized in practice, they will characterize but one of the many aspects of the overall policy, whereas substantial results of the development will be expressed in another, richer language—the language used for the selection of objectives and mechanisms for their attainment.

The practical value of any economic prognosis is defined by the way it associates the retrospective analysis and elements of the image of the future created by the prognosis. A prognosis is needed more for extracting from its analysis information useful for the development of today's economic policy, rather than for forming an image of the future.

A constructive use of the results of research performed as part of a long-term prognosis of national socio-economic development in the development of a system of priorities of current economic policy can be realized in various ways.

One way would be to develop prognoses aimed at discovering problem situations that may arise in the future should certain preventive measures not be taken in advance. An analysis of the results of such prognoses will ensure that future problems of the socio-economic development are taken into account in the course of the development and realization of current policy.

Another approach may be based on the development of prognoses in order to evaluate most probable outcomes of the implementation of available economic policy options. Prognostic assessments of possible outcomes of the implementation of economic policy options can be used as criteria in the process of the substantiation of its specific contents. This would ensure that the development and realization of current economic policy takes into account an image of the far-off future corresponding to this policy.

In both cases research performed within the framework of long-term prognosis would provide arguments in favor of certain structural, technological, and institutional changes aimed at achieving desired results of socio-economic development, and to effectively adapt to specific features of perspective reproductive situation, which would help appropriately increase the priority of strategic goals and future problems (including environmental ones) in the process of the development of a trade-off system in the current economic policy.

A wide substantial context of research performed within the framework of long-term prognosis creates favorable preconditions for synthetic conceptual schemes describing the interdependency and interconditionality of the various aspects of the development of the economy, environment and society. In particular, it is ideal for demonstrating the interconditionality of the criteria of rationality used for defining the priorities of the economic and environmental policies.

The experience of developed countries testifies to the fact that the priorities of rational nature management have come to the foreground, and environmental concerns have occupied a high position in the system of individual and social values only at a certain phase of their development, after most burning problems of well-being improvement had been resolved, and the society had acquired substantial resources that could be applied to the solution of environmental problems.

Today's Russia is still far from such state. A significant hurdle on the path towards the "environmentalization" of the public conscience is presented by the fact that after many dozens of years of meager existence justified by the need to mobilize all available resources for the building of a "bright future" the society is not prepared for the renewal of the stereotypes of a "mobilization" development mode. In this situation a long-term socio-economic prognosis may contribute to the formation of a trade-off system in the economic policy, by showing that with today's mode of the economic development the expected consumption growth is significantly devaluated by adverse well-being changes in those development aspects that are defined by the continuing degradation of the environment.

Long-term socio-economic prognoses objectively promote the humanistic understanding of public development asserting that in the assessment of its results a bigger stress shall be made on the system of the parameters of social, demographic and environmental well-being, rather than on production and consumption growth rates.

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## ECONOMIC GROWTH WITHOUT DEVELOPMENT— DEAD-END DIRECTION FOR RUSSIA

Discussing the optimization of eco-economic relations we invariably try to resolve these problems within the framework of the traditional economic system. The “economic growth leads to a progress in human development” formula has failed and resulted in a growth of the number of the poor, destruction of natural systems, a general rise in social instability. Economists increasingly come to regard economic growth as a means for state and regional development, not as the purpose thereof. We should not keep using morally outdated concepts in new development models.

The Russian economy has witnessed the phenomenon of economic growth for eight years now (6.4% in 1999, 10% in 2000, 5.1% in 2001, 4.7% in 2002, 7.3% in 2003, 7.1% in 2004, 6.4% in 2005, and 6.7% in 2006). However, these quantitative indicators of economic growth do not mean that the country’s economy is on the path towards a sustainable development. Growth without development, without rigid limitations, promotes commonwealth losses, which is the basis of social welfare.

Today, when world economic relations are being actively formed, there has been a significant change in approaching development: from liberalism based on individualistic concepts to holism based on the principle of universal integrity. The new model of Russia’s development shall be formed taking in account these conditions, providing for not just growth factors, but restrictions conducive to a quality development process.

### On the Definition of Objectives

The systems theory says that any system is organized and organizes itself around its main objective. This objective is viewed as a reference point for directing flows of relations, powers and responsibilities: reaching the target state is associated with the implementation of the system triad: objective, organization, function. Therefore, the objective definition unit is fundamental for any controlling system. However, it’s the controlling system that is still the least efficient and modernized part of the national eco-economic policy. The objective definition unit that is determinative for a qualitatively different development still remains absolutely undeveloped: the controlling system in its present state is inadequate for those environmental challenges that the humankind is confronted with. This inadequacy can be observed in those miserable, sometimes simply ludicrous “new” concepts; in the inability to understand the need to change the tradition economy paradigm calling for a resource-based development and the “protection of environment”. It should be noted that from the environmental point of view the very concept of such “protection” is fundamentally flawed, because people’s activities shall be arranged in such a way that would exclude and preclude those impacts and consequences of these activities that would later require “protection”.

As a result of the above, we have spent many years just marking time, and an escalation of the sustainable development concept hasn’t produced desired effects.

It turns out that the market is not very sensitive to environmental degradation, and is indifferent to the sustainability of natural complexes. It’s quite understandable: market works as a primary tool for controlling an

**A growth without development, without strict limits, promotes loss of public goods lying in the foundation of social well-being.**

economic system, therefore it is well suited for optimizing an economic system by means of those criteria that it understands: profits, revenues, growth rates. As a result of this, an economic system “behaves well”, in accordance with set objectives, meeting the principal optimization criteria. It would be irresponsible, to say the least, to expect that it would voluntarily wish to be engaged in environmental protection, as its objectives are quite different. Today, in our bitter time, the principal objective of our economy is the doubling of the GDP. Although it’s clear that the doubling of the GDP based on current technologies will significantly deteriorate such public goods as water, air, soil quality, etc., the controlling system as a whole, headed by its hierarchs, has been organizing the system for achieving set goals. To them the object to control is an economic system aimed at reaching traditional objectives.

### **On the Priority of Objectives in the Economy of Development**

Going back to the very conception of the sustainable development concept, it should be noted that within the context of principal international documents the primary idea concerned allowable development within the limits of the biosphere. This thesis was especially clearly stated in the first documents (See M. Strong’s report at the 1972 Stockholm Conference; the 1987 Report from the UN World Commission on Environment and Development titled “Our Common Future”, Rio papers (1992), etc.). A priori the primary objective was set to establish such development that would preserve planet Earth for future generations, i.e. an environmentally allowable development. To reach this objective it is necessary to expand control tasks, including the most important tasks of regulating economic growth in order to achieve quality development parameters.

### **On the Changing of Control and Regulation Object**

Today singling out natural and economic system would present a problem: human economy is literally integrated in natural complexes. In order to accomplish a transition to a sustainable development economy a change of the very object of economic theory and practice is required: a transition shall be made from the economic system to the eco-economic system. An educated home owner, who realizes that his home is a place where he and his descendants will live, doesn’t make a distinction between economy and environment: they both, intermingling, are naturally present in his everyday life, his work, and the work done by his land.

When an eco-economic system becomes a control object, the objectives of the system’s development change. The principal objectives of an eco-economic system are the conjugacy, commensurability, balance of natural and industrial potentials within a territory, the preservation of a quality human environment, and it’s only later, at further stages of the optimization of

an eco-economic system, that the criteria of the economic subsystem will play their role: profits, revenues, growth rates.

Unfortunately, no-one has ever purposefully established such eco-economic systems; such objectives for territories’ development have never been set, even now. In some territories an environmentally balanced development did exist before—when human activities were based on local renewable natural resources, and their consumption didn’t exceed their regenerative ability. One could use the territories of such monasteries as Valaam, Aphon, and Opt as examples. State and regional development strategies have never been aimed at creating environmentally balanced complexes, whereas current mechanisms of environmental regulation of economic activities alone can not ensure meeting requirements to a balanced system in practice. However, this doesn’t mean that such systems can’t exist. Their establishment requires an absolutely different set of objectives.

The expansion of a control object from an economic system to an eco-economic one, within which every enterprise, industrial center, city or region shall be regarded as an eco-economic system, makes control and regulation a significantly more complex task: balancing natural and industrial potentials becomes the principal controlling process promoting sustainable development. These calls for changes everywhere else: objectives, tasks, functions, information databases, the structure of controlling subsystems. When this happens, in lieu of the inefficient concept of the “protection of the environment”, new environmentally balanced complexes will have to be designed from the very onset, the economic and natural potentials of a territory will have to be balanced from the very onset, the placement of material structures will have to be balanced with the self-preservation potentials of natural systems. Profits, revenues, and costs will serve as the criteria for the optimization of the next level of the eco-economic system organization. All of the above would be a step towards regional sustainable development.

### **The Matrix of Laws for Sustainable Development**

Humankind has reached a very demanding stage in its history that requires a change in the economic paradigm, i.e. in the shape of its structure and functioning. A transition is required to a new stage of material culture, a culture that would be compatible with the already depleted natural potential of the planet, a new portfolio of development strategies is required.

With this approach the principal constitutional norm shall be established—a standard setting the allowable eco-economic balance for each specific territory. It’s around such constitutional norm that a solid matrix of eco-economic and environmental legislation can be built. As of today, the bloated environmental legislation dispersed as hundreds of various docu-

ments, can not govern development of economic systems within the limits of allowable development.

About 20–25 years ago, when departments responsible for the distribution of productive forces existed within structures of oblast and town executive committees, such methods regulating the expansion of industrial entities within territories were extremely timely. It was then that a team of scientists working at the Russian Academy of Sciences Institute of Ecology of the Volga Basin suggested an energy-based method for the comparison and balancing of natural and industrial potentials within a territory. They suggested a standard of maximum allowable energetic load as a principal norm regulating industrial development of a territory. The basic idea of this method is that the development of an economic complex should go on within limits set by the technical energy standard calculated basing on the assimilation potential of the territory. Such rigid energetic standard promotes searching for energy-saving technologies: you can develop further, but within limits set by the energetic standard. Findings and results of research and implementation of the energy-based approach in eco-economic regulation can be found in quite a large number of science publications.

It would seem that in the new economic conditions, when the foreign market conditions are favorable for Russia, new opportunities appear for a qualitative reform of the economy, first and foremost, of its structure. Let's see what is happening in the Russian economy. The GDP growth in 2005 (just like in preceding years) was achieved mainly thanks to oil and gas sales. Basic industry branches are 3 to 5 times as resource and energy intensive as those in other countries (on the average). The GDP growth in recent years has produced no effect on the growth of industries that are especially important for the renewal of the technical and technological, scientific and educational, and innovative potentials of Russia. Branches of industry oriented at the domestic development of the national economy have seen almost no development. The GDP growth in general has no impact on the dynamics of fundamental macroeconomic parameters.

### **Change of Course Shall Start in the Regions**

It's a well-known fact that the issues of the preservation of natural systems and human environment are always strictly territorial problems, associated, on the one hand, with the whole set of industrial branches operating within this territory, and, on the other hand, with the totality of natural complexes unique in each region. However, current trends in the distribution of powers and responsibilities between central and regional authorities speak of a complete chaos reigning in the systematic control triad: objective, organization, function.

And yet, hope remains that a concrete implementation of new development strategies will be started by

regions that have developed environmentally strong development strategies and possessing principally new databases. Documents describing territories' natural potentials and various local economic objects, together with current monitoring data and statistics form a huge collection of information that shall be structured to serve new regional development objectives. Thereby, one should hope for the emergence of new regional strategies, regions' choice of eco-economic type of development for its territories.

In the near future the issue of mutual relations between nature and man is going to become a defining motive of activity at all levels, from governments to individuals. Thus, according to forecasts made by the US National Intelligence Council (See the 2005 Report "Outlines of the World's Future", in 15 to 20 years socio-environmental criteria will grow to be significantly more important, as they will dominate in the decision-making process in the spheres of business and state power. This forecast is based upon three principal arguments: a) economies in certain dynamically developing countries will exceed in scope those of highly developed countries; b) breakthrough R&D and infrastructure-reforming programs in the EC, USA and Japan will produce by the year of 2030, and c) global—energy and water— crises are expected to happen at about that time.

If a country assumes responsibility for a radical change of course that would make the degree of coordination between the strategy of the development of the society and that of the nature a measure for assessing the functioning of a determined social organism, such state will have a justified right to speak about a new environmental policy. Moreover, such state will play a special role in the global "nature-society" system. The future will belong not to countries that have achieved a high level in the high-tech sphere, but rather to those that will be able to induce new ideas in their relations with nature.

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# THE ROLE OF THE ECONOMY IN CREATING INCENTIVES FOR ENVIRONMENTAL PROTECTION

Recently I read a 1974 article by K.G. Gofman, M.Y. Lemeshev and N.F. Reimers titled "The Economy on Nature Management (Tasks of a New Science)". Back then it really was a new science developing within the strict framework of economics. The tasks of this science were later formulated in the sustainable development concept, and, in short, they concern the development of the economy in agreement with environmental imperatives.

However, over the 30 plus years those have passed since the publication of this article, and especially after the adoption of the sustainable development concept, the content of economy in nature management economics has been steadily decreasing—I'm talking about methodological studies, as economics, undoubtedly, has been present in cost-effectiveness analyses.

This happened, evidently, because research has come to concentrate not upon an economic system in its interdependence and interaction with the environment under man's impact. In many cases the subject of research was a unified system made up of the economic and environmental subsystems. With this approach, purely economic laws and purely economic methods have been applied to such unified system.

Representatives of this approach that first appeared in the West and developed into environmental economics usually use economics in order to convince everybody in the economic value of nature as such. In this case the value of the nature is measured in cost units. As a result, they unify the economic and natural systems borrowing measuring units from one system only, i.e. emergent effects are ignored completely. This contradicts, first, to the basics of the general systems theory, and, second, to the laws of economics. The subjects of economics are production, distribution, exchange and consumption. In this context economics can deal with the environment only in the terms of its economic use.

Evidently, measuring all of the nature in monetary units, the proponents of this approach are guided by the humanistic principles of their attitude towards the environment, hoping that the higher the price they set for nature, the greater attention governments will pay to it. They are wrong, as authorities responsible for a nation's economy, understanding the weakness of the relationship between such abstract assessments and real economy, simply ignore their assertions.

In a real economy natural resources have been assessed already, albeit indirectly, moreover so in a market economy. Therefore, the task of nature management economics is to single out assessments of natural resources from other economic indices. For example, rental incomes are contained in the income, and so far we can't explicitly differentiate them from the income. Enterprises economize on environmental protection expenditures and pollute the environment. People suffer from this practice and have to undergo treatment and buy medicines, but these expenditures that constitute a certain portion of the damage are diffused, and it would be hard to put them together.

Contrary to this approach, other assessments are being introduced into the real economy, and, should they be accepted, it is going to break all economic foundations. For example, the RF State Duma reported recently

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that Russia's natural resources were assessed as worth 140 trillion dollars.

Taking into account that the overall world wealth is worth 100 trillion dollars, what natural resources in Russia were assessed? Most probably, it were not natural resources that were assessed, but all Russia's free goods were assigned an economic value. That's an appropriate example of how the natural and economic systems are unified, with sticking to monetary units of measurement. If it is really necessary, why not introduce some special units for measuring the natural-economic system, for example, eco-rubles or eco-dollars?

What other undesirable consequences can the desire to evaluate all free goods in cost units have? First of all we get the changes in the structure of industrial factors and a decrease in the comparative economic evaluation of labor and capital. And, as is generally known, low-value assets are spent in a non-rational way. Besides, if unreasonably high values of natural resources are brought into the economy, it will be something similar to indirect taxes whose amount will exceed the remaining portion of incomes. And most important, we'll find ourselves without an economic mechanism for the transition to innovative technologies.

The economic evaluation of any resource influencing economic activities and the quality of life is defined as the increment of the prosperity function when this resource grows. This approach provides a way to economically evaluate natural resource potentials, including assimilation potentials, by means of evaluating damages resulting from their destruction. As a result, evaluations can be obtained that would be supported by real amounts of already suffered damage, contrary to the those obtained within the framework of the concept of general economic value of natural resources and prognoses of future revenues from additional resources that are based, as a rule, on indirect, speculative conclusions.

A government's environmental tasks are to preserve natural systems, maintain their integrity and life-supporting functions. But do these environmental tasks agree with the economic tasks? They do if the economy suffers losses due to adverse environmental conditions, if it is economically profitable to protect the environment. When environmental protection is not economically profitable, then administrative, prescriptive methods of economic management can be applied—those that oblige economic players to adhere to environmental standards.

The variety of the forms of eco-economic interaction calls for the use of both administrative methods of economic management aimed at environmental protection and the use of economic interests for environmental protection, when such interests do exist and have been found out.

So, the tasks of the environmental policy are performed in the economy in two forms: non-economi-

cally, when the economy is required to provide means for their resolution, and when it restricts economic activities; and economically, when the economy is interested in performing these tasks. However, not all people, and not always draw a distinction between these two types of tasks; today a trend is highly visible to reduce all tasks to the second type, setting hopes on the omnipotence of the economy and economic interests.

When a disease presents a real threat to a man's life, one should force him to undergo treatment, and not try to convince him with the calculations of the sums he is going to lose if he becomes an invalid. The latter is a viable argument only when the man can become only partially disabled due to the disease.

It can't be said that the science of economics is absolutely passive in the implementation of administrative methods for controlling nature management. It involves a number of economic tasks, namely defining and optimizing expenditures required for meeting environmental protection standards, assessing the impact of environmental restrictions on economic activities, etc. However, the importance of economics grows significantly in the performance of such tasks of environmental protection that can be expressed in the terms of economic efficiency; i.e. when environmental protection tasks arise within the economic system.

When the RF Public Chamber was being created, the member of the RAS E.P. Velikhov, in response to pessimistic views upon the perspectives of this organization, said that the chamber's task is to generate and present such arguments that the country's authorities and decision-makers would find hard to ignore. Today, when equally grave threats are presented by poverty, drugs, crime, etc. how can one persuade the authorities that means should be primarily provided for environmental protection?

First of all, environmentalists shall convince everyone, including the administration, that today's the state of the environment is threatening or will become such in the nearest future (if it really is so). The arguments shall be convincing. Environmentalists and economists are making a mistake in that they don't see what position environmental problems occupy in the overall multitude of the country's problems, and quite often it happens that they ignore other problems.

We observed an environmental boom back in the 70s and 80s and grew accustomed to a high interest towards the objects of our research; today we should get used to new conditions demanding a greater validity of our suggestions, a more articulate and thorough argumentation.

Sometimes methodological inconsistency is observed in defining the category of damage to the economy caused by environmental violations. When this damage is presented as damage to the environ-

ment, and environmentalists, citing its enormous amount, wish to draw the government's attention to environmental problems, they attain quite an opposite result: as it is the environment that suffers, and not the economy, the problem is viewed as that of a humane attitude towards the nature, and not an economic one. Today there are some people who try to assess damage to endangered species as if they were economic subjects.

In reality economic damage resulting from environmental violations is generated as follows: the economy impacts the environment (i.e. damages it), next the environment undergoes changes, and the economy starts functioning less efficiently in the worse environment (and thus the economy suffers). That is, the economy, destroying the environment, suffers losses as a result of its own actions. These scheme as such stresses the limited interest of the economy towards environmental problems—the economy is interested only as long as these problems produce an effect within the economic system. It is the economic damage that can make the government concerned, not the environmental damage. In this case the government can set the economic task of comparing expenditures on environmental protection with economic damage from their deficit. But when the government is told about damage to the environment, it considers expenditures aimed at its reduction as an external load on the economy, as expenditures that are not repaid.

All this is simple enough, but why even economics textbooks don't say anything about environmental damages and don't even try to clearly explain the meaning of this category? The methodical paper<sup>1</sup> dated 1986 clearly speaks of damage to the economy caused by environmental pollution. As it turns out, in 20 years the problem hasn't been presented more clearly, on the contrary, the clarity has disappeared. Probably, it has happened due to the fact that the economy of nature management has started to cover wider areas but lost a methodological profoundness.

A promising economic methodology for promoting environmental protection can be based only on the category of economic damage. Economists shall be insistently looking for specific proofs of significant damage caused to the economy, and not anything else. Unfortunately, there are few such convincing proofs.

<sup>1</sup> Temporary Standard Guidance on the Assessment of the Economic Efficiency of Environmental Protection Activities and the Assessment of Environmental Damage Caused to the Economy by Environmental Pollution, Moscow, Economical Pub., 1986.

<sup>2</sup> Ryumina, E.V., Modeling of Interrelations between Economic Development and Environmental Protection, in Economics and Mathematical Methods, No. 2, 1991.

<sup>3</sup> Abram an, S.I., Ryumina, E.V., et al., Economic Efficiency of Environmental Innovations, in Motor Transport Environmentalization, Saint-Petersburg, 2000.

<sup>4</sup> Gordin, I.V., Russia's Water Protection Zone Crisis, Moscow, Fizmatlit Publ., 2006.

As an example of a convincing assessment of damage caused by environmental pollution at the macroeconomic level we can cite our work<sup>2</sup> that shows as a result of estimates using an economic model that this damage amounts to 15 per cent GDP.

An effective example of the assessment of damage to a municipal budget is the proof of the efficiency of technological innovations in the public transportation system through the assessment of economic losses due to the expenditures on the medical treatment of people whose illness is the result of air pollution in Moscow<sup>3</sup>.

An extremely efficient way to prove the need for environmental protection is to demonstrate damage to private investments. Thus, I.V. Gordin<sup>4</sup> used a very interesting approach to the justification of the need of state control over the construction of private cottages on river banks and sea shores: "It seems that an optimal way to organize the much needed dialogue and establish partnership relations between the state and the individual would be to attract people's attention... to the economic depreciation of river bank and sea shore areas in the course of the development of the socio-environmental crisis... What is needed is not hasty administrative sanctions, not sentimental sweet-talk, not abstract appeals to one's sense of being indebted to nature, or social responsibility and the like, but objective, dispassionate prognoses of the drop in the services and real estate markets, the bankruptcy of multi-billion real estate shore complexes." (Page 190). There is no doubt that developers operating on river banks and sea shores will pay attention to an example of a lake shore cottage whose market price went down from one million to 200 thousand dollars due to the lake's environmental degradation as a result of man-produced overload.

Therefore, it would be a mistake to believe that above-the-ceiling economic evaluations of natural resources will promote environmental protection activities—it's an illusion. Environmental protection can be promoted only by proving the efficiency of environmental protection measures within the economic system that is by estimating losses caused by people's passivity and the effects of active environmental protection activities.

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## **SOME CONCEPTUAL CONSIDERATIONS REGARDING THE INTRODUCTION IN RUSSIA OF UP-TO-DATE ECONOMIC TOOLS FOR THE ADMINISTRATION OF NATURE MANAGEMENT AND ENVIRONMENTAL PROTECTION**

One of the most important basic prerequisites for a sustainable development at the final stage of Russia's transition to a socially-oriented market economy and its advance on the path of technological, economic and social progress is the creation of an efficient system of nature management and environmental protection control, incorporating and implementing up-to-date internationally recognized principles and mechanisms in this area and ensuring an environmentally balanced development of national economy and the social sphere.

The need for a strategic approach to nature management and environmental protection, and the search for efficient ways to rationalize the use of natural resources and environmental protection call for the implementation of a wide spectrum of scientifically justified methods and procedures, including those used abroad, adapted to Russian conditions. Today, when the role of economic approaches to the control over various aspects of the country's development is increasing, the solution of economic and financial problems in the area of environmental protection and rational use of natural resources is steadily gaining in importance.

Taking into account the latest trends of the growth of the national economy, one should note the aggravation of environmental problems in a number of Russian regions, and the increase of the concern of the public, state and local self-government administrations. Also, the changes in the structure of the Russian economy that have taken place over the past two decades, the ageing of capital assets, increased accident rate at industrial enterprises and other factors have caused a significant growth of the adverse impact of human activities on practically all components and objects of the environment.

It should be stated, however, that the degree of the state's reaction to new environmental challenges in the conditions of new economic management approaches and principally different socio-economic reality doesn't correspond to the nature and the level of these challenges: the current system of taxes, excises, and duties doesn't take into account objective financial needs in the area of nature management and environmental protection, doesn't fully employ the internationally recognized "he who pollutes pays" principle, the latter based on the need (recognized by the world community) to internationalize external environmental expenditures; the system of economic incentives for the introduction of alternative, nature-conservative, low- and nonwaste technologies hasn't been established.

It should be noted that in Russia over the years of 1991-2006 the legal, methodical and organizational base of nature management and environmental protection at various levels of the administrative/regional hierarchy was significantly expanded, conditions were created for the transition to a qualitatively new level of the use of market mechanisms and tools in this area. At the same time, the conceptual basis of economic control over nature management and environmental protection shall be further developed, together with the complex of economic control tools in use in Russia.

Besides, at the present stage of Russia's development, it is an urgent task to efficiently integrate Russian administrative and economic structures into market economy, and implement principally new decision-mak-

**At the current stage of Russia's socio-economic development, it is necessary to further improve laws and other regulations in order to make the economy more environmentally conscious and the use of natural resources more efficient, and to create proper organizational conditions, by means of the development of concepts and priorities for the perfection of economic regulatory measures in this sphere.**



ing models. Socio-economic processes are dynamic, and this calls for the development of new approaches and administrative technologies for the strategic development and maximally efficient adaptation to environmental changes, with the whole range of existing risks taken into account. It is necessary to further introduce both internationally recognized administrative principles and methods, and implement the achievements of economic theory and practice in the area of the creation of innovative economic administrative tools.

In these conditions what comes to the foreground is the task of the creation and further development of a scientifically substantiated concept for the rationalization of nature management, preclusion and reduction of adverse human impacts on the environment that should comprise a legal basis and regulating and corrective mechanisms, including economic tools. This task calls for a purposeful work of the further improvement of the methods of eco-economic prognosis, development and implementation of environmental protection programs and activities. The practice of creating incentives for investments in the sphere of rational nature management and environmental protection should be developed significantly.

In order to internalize external expenditures and adverse environmental effects an institutional structure should be developed in the sphere of nature management and environmental protection that should address the issues of economically justified re-distribution of responsibilities between the state and economy players. It should be necessary to employ progressive organizational forms of the solution of priority environmental problems, to implement a number of innovative of eco-economic administration.

It should be noted that the solution of the problems of socio-economic development together with efficient administration in the nature management and environmental protection sphere has been reflected in the policy, strategy and tactics of international organizations and programs, both at UN and regional levels—WHO, UNEP, ISO, UNIDO, IEA, OECD and others, including regional economic integration organizations such as the EC. An increasingly large significance is assigned to a combination of legal, administrative, institutional and economic regulators for an incremental achievement of set goals based on inter-sector approach that takes into account goals and priorities of the economic and social development of specific areas and branches of industry.

For example, the principal directions of the UC transportation policy until 2010 include the creation of mechanisms ensuring complete reimbursement of society's expenditures and the harmonization of fuel taxes. Concurrently, the UC develops the practice of excise exemption of enterprises introducing new technologies and producing more environmentally-friendly fuels, measures are taken to provide incentives for the use of hydrogen and biofuels.

Fairly high prices are established on resources and tax rates, which results in behavioral changes in the sphere of the introduction of resource-saving and environmentally "clean" technologies. Large-scale programs are implemented on the mastering of renewable sources of energy, new taxation mechanisms are introduced, as well as payments promoting reductions in the consumption of environment polluting raw materials and consumables. At the same time, these measures are taken step by step, because a sharp increase in prices and payments may undermine profitability and competitiveness of enterprises.

Therefore, at the current stage of Russia's socio-economic development, in order to make the economy more environment-oriented and increase the efficiency of the use of natural resources, the legal base and other regulatory norms should be further perfected, and organizational conditions shall be established, including the development of a conceptual basis and priority directions of the improvement of economic administration in this sphere.

It should be noted that the international community has worked out a universally recognized methodology for the solution of the majority of problems in the sphere of nature management and environmental protection. The methodology is based on setting long-term goals and the development of strategies for their achievement. This includes the development and realization of plans and programs implementing these strategies in conformance with legal, financial, technical and organizational and administrative conditions, requirements and limitations. From the point of view of the final efficiency of the functioning of a system of the administration of environmental protection activities it is important to establish a mechanism for formulating state's goals in this sphere and specific indices (indicators) of their achievement in the long, medium and short-term perspectives.

In the past (in the former USSR) a similar mechanism that provided for, when developing a prognosis (plan) of the country's socio-economic development, establishing target quantitative indexes of the use of natural resources and man's environmental impact, was the principal tool for controlling the levels of adverse environmental impacts nation-, industry- and region-wise, and at certain points.

Unfortunately, today similar prognoses and plans, even regarding a relatively narrow list of compounds responsible for 80 per cent of the gross amount of environmental pollutants, in coordination with prognoses and plans of socio-economic development, are not developed. At the same time, establishment of target indices of exhausts (effluents) of primary pollutants should be one of the most important elements of the mechanism of state control in this area. It's on this basis that required measures aimed at the reduction of adverse environmental impacts shall be provided for.

Prognostic methods in use today are based on the extrapolation of retrospective volumes of the con-

sumption of natural resources and environmental pollution with their minimal adjustment in accordance with forecast changes of macroeconomic indices. However, what's required here is a factorial analysis of the dynamics of the changes of respective indices that should be by all means taken into account industry- and region-wise on the basis of target indices of the introduction of resource-saving and environmental-friendly technologies.

The following elements of the complex of methods, mechanisms and tools of economic administration can be singled out for priority realization in the short-term perspective:

- increasing economic responsibility for excessive (exceeding established limits) consumption of natural resources and environmental pollution, including technogenic accidents and catastrophes;
- introduction of best available technologies on the basis of justification an approach to the location of such technologies in various branches of the national economy, of the development of a complex of measures aimed at providing economic incentives for their implementation;
- the use of federal budget means for granting subventions to RF subjects and subsidies to enterprises and organizations with the purpose of the realization of efficient environmental measures;
- participation of budgets at all levels (federal, regional and local, including state off-budget funds) in project financing;
- the granting to economy players implementing an efficient environmental policy, of financial privileges and other preferences corresponding to the rules of the WTO and other international organizations;
- the differentiation of the taxation of enterprises depending on the degree of environmental damage as a result of their activities;
- introduction of taxes/payments on products whose consumption or disposal results in environmental pollution;
- creation of incentives for resource saving and/or environmental pollution reduction by means of the introduction of the system of deposits for environmentally hazardous products that require specialized facilities for their neutralization/disposal;
- introduction of accelerated amortization for environmental protection equipment;
- granting of investment tax credits, reduced interest rate loans (i.e. financing the reimbursement of interest rate), loan insurance;
- establishment of an environmental risks management policy, including an efficient implementation of a legal basis for their insurance;
- use of the finance lease of resource-saving and environmental protection instruments and equipment;
- introduction of the practice of buying and selling, on an auction or competitive basis, of licenses (permits) for pollutant exhausts (effluents) and waste disposal, including the creation of conditions for the exchange/off-board sales of licenses for exhausts/effluents by economic players, the creation of pollution quota banks;
- use of offset procedures and programs for attracting investments to this sphere;
- the establishment of private-state partnerships in the sphere of nature management and environmental protection (i.e. combining the resources of society/state and/or local authorities and the private sector on a long-term and mutually beneficial basis);
- introduction of environmental ratings in order to improve environmental protection investment activities;
- use of stock exchange tools for nature management and environmental protection control.

The development of such tools and methodologies for their realization in practice will also promote a significant growth of the overall efficiency of the functioning of the economy and social sphere, adoption and realization of administrative solutions at the federal, regional and local levels.

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## IMPROVING THE SYSTEM OF PAYMENTS FOR ENVIRONMENTAL POLLUTION AND WASTE DISPOSAL

Payments for environmental pollution and waste disposal are the core of environmental protection activity administration based on the "he who pollutes, pays" principle.

In Russia the system of environmental payments was first introduced in 1990, when a large-scale experiment was carried out.

After the completion of the economic experiment, in accordance with the Council of Ministers of the RSFSR Resolution No. 13 dated January 9, 1991, payments for environmental pollution and waste disposal were introduced universally.

Payments were collected for the following:

- Air emissions of pollutants from stationary and mobile sources;
- Discharge of pollutants and polluted liquids into water reservoirs or on land surface, including that performed by enterprises and organizations through public sewage systems;
- Waste disposal.

Basic payment rates were established for maximum allowable exhausts (discharges, waste disposal) of pollutants into the environment and for exceeding these standards. Such payment rates were established for all components of a pollutant (waste), with the degree of their hazard to the environment and human health taken into account. These payments were accumulated in a system of out-budget environmental funds comprising the Federal environmental fund and republican, territorial, oblast and local environmental funds. This way in the years of 1990-1992, extremely quickly, a system of environmental payments and funds was created, and, provided it developed further, problems of environmental protection could be resolved successfully.

Later the situation with organizational principles, goals and objectives of the eco-economic mechanism became significantly difficult. First of all, this was associated with the general worsening of the socio-economic situation in the country in mid/late 90s, economic recession, decrease in budget revenues and expenditures, etc. Rates of the payments were not increased gradually, as the strategy of the development of the economic nature management mechanism required; on the contrary, they were decreasing. Indexation rates were not taking into account inflation rates. The amounts of the payments grew so small that it became more profitable for enterprises to pollute the environment without investing money in environmental protection measures. Next a decision was made to dissolve environmental funds. In 1998 the RF Budget Code (Article 44) provided a list of state off-budget funds that doesn't include environmental funds.

In the conditions of sharp under-financing of environmental protection activities from budgetary sources (first of all, the system of specially protected natural territories), environmental funds and payments for adverse environmental impacts turned into the primary source of financing of local environmental protection bodies. This was bound to cause objections of financial and controlling bodies.

It was in this situation that a gradual phase down of earlier established complex eco-economic mechanism began. For example, in mid-90s most

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of environmental funds lost their off-budget character. In the beginning of the 21st century the Federal environmental fund and most of regional environmental funds ceased to exist. And so it happened that eco-payments lost their punitory/stimulating nature and turned, actually, into one of the numerous means of forming budgets at all administrative levels.

The current level of environmental payments in Russia is rather low and doesn't reflect environmental damage nor socially required expenditures on pollution neutralization. Therefore, the system of environmental payments and taxes urgently needs improvement. It shall meet the following requirements:

First, it shall stimulate the creation of a favorable environment by means of reducing adverse environmental impacts to such pre-established levels that ensure environmental safety of the population and the preservation of the gene pool.

One shouldn't forget that today we live in the market economy. In these conditions the driving force and primary goal of production is obtaining maximum profits. After all, all economic activities, including those in the environmental sphere, are in practice subordinate to this goal. Therefore, nobody will be interested in investing money if this doesn't promise any profit.

We consider this state of things a serious deformation of the normal market mechanism, when taking environmental protection measures results in the reduction of enterprises' profits.

In order to create incentives for environmental protection activities in the conditions of normal market relations, the amount of payments (taxes) for environmental pollution, as a rule, shall reflect socially required expenditures on the elimination of pollutants, with normative profits taken into account. In this case favorable conditions will be established for a wide development of environmental entrepreneurship and stimulating the solution of environmental protection problems. As for wastes, payments shall reflect socially required expenditures on their environmentally safe stockpiling (disposal), with normative profits and payments for the use of natural resources taken into account, including payments for land estrangement.

It is necessary, in the nearest future, to perform a universal transition from usual waste dumps to waste disposal sites built as complex engineering structures equipped with systems preventing air and water pollution. The methane gas produced as a result of waste decomposition may be used for the generation of heat and electric power. If a facility for the disposal and processing of wastes pollutes the environment, it shall pay ecologic payments as well.

Under current conditions taxation load on enterprises should not be increased—it is high enough already. Therefore, increases in the amounts of environmental payments (taxes) shall be accompanied with appropriate reductions of other taxes, and this shall be reflected in the taxation legislation.

Second, equal environmental conditions shall be established for competing economy players. Unfortunately, such conditions haven't yet been created in the Russian practice.

The problem of establishing equal economic conditions for competitors exists in both domestic and foreign markets. This problem can be solved by the following means:

- a) taxation of air emissions (discharge) of pollutants within limits specified by standards (norms) established basing on best technologies;
- b) payments for emissions (discharges) exceeding established standards (norms).

Before emission/discharge standards are established, current maximum allowable emission/discharge norms can be used as a temporary measure.

Environmental pollution tax for emissions/discharges within limits established for specific pollutants may be regarded as payment for the right to use a territory's assimilating potential, i.e. the ability of a natural area (water basin) to decompose natural and man-made pollutants without destroying itself, and neutralize their adverse impact upon life at the moment of the decomposition and in further cycles of biological (biotic) cycle where the compounds being decomposed participate.

The overall amount of emissions/discharges of pollutants within the limits set by standards from all enterprises shall not exceed the area's assimilating capacity. The tax (unlike environmental payments) shall be included in a product's prime cost, and its price. In this case both the consumer and the polluting entity pay for environmental pollution. The consumer pays for the emissions/discharges of pollutants within the limits of standards (norms), i.e. for the amount of pollutants that can't be avoided with the introduction of the best technologies existing in the international practice, and the polluting entity shall pay for exceeding the requirements of standards established for emissions/discharges. This tax shall go to local and regional budgets and used for socio-economic needs of the area, and the environmental payments shall go to newly established environmental funds designed for the solution of environmental protection tasks.

Third, the realization of environmental programs shall be stimulated.

In today's socio-economic conditions the development of environmental programs covering the federal and regional levels, and those of enterprises, shall be made obligatory.

When developing environmental programs we shall aim at achieving the following:

- a) the use of the biosphere's resources shall be performed within the limits of its reproduction capacity;
- b) emissions (discharges) of pollutants shall not exceed the assimilating potential of the environment.

The most important output parameters of environmental programs shall be the limits of emissions/discharges of pollutants into the atmosphere established for areas and enterprises. Said limits shall define annual amounts of emissions/discharges of pollutants with their gradual reduction to the normative level not exceeding critical loads for areas, and that of emission standards for enterprises, established beforehand at the best internationally achieved levels.

For ensuring environmental safety an important task is to form and institutionally support a system of environmental restrictions on economic activities, within which system the development and placement of productive forces shall be performed.

The solution of this task is possible only if integrated environmental monitoring is established for the resolution of the following tasks:

- Obtaining, on a regular systematic basis, of data on pollution sources, characteristics of actual state of the environment, on the exceeding of actual critical man-induced environmental loads over critical ones;
- Collection and processing of map data on the state of the ecosystem (area rendering by the degrees of environmental hazards);
- Collection and processing of an information data bank and knowledge on the character of the environment and factors producing impacts on its state;
- Supplying subscribers, users of information products, with substantiated advice on carrying out industrial-engineering, economic and social activities.

Integrated monitoring encompasses all kinds of environmental impacts.

When establishing environmental restrictions the following shall be taken into account:

- Critical (extreme) loads (individual and integrated) from human impacts on specific territories, natural systems, regional faunas and floras;
- Maximum allowable amounts of the withdrawal of specific natural resources from ecosystems;
- Limits on emissions (discharges) of pollutants into the environment established for specific territories (by subjects of the Russian Federation) on the basis of federal and regional environmental programs;
- Standards and limits on emissions (discharges) of pollutants into the environment for specific enterprises, established on the basis of environmental programs.

Such system of norms, provided that a reliable database on the state of the environment is creat-

ed, should play an exclusively important role in the management of environmental protection activities. The development and collection of payments (taxes) for the pollution of the environment should be performed on the basis of the above information and normative bases.

In order to stimulate the realization of environmental programs, payments for emission (discharges) of pollutants into the environment shall be split into two parts:

- a) Those within the interval between the standard and the limit;
- b) Those exceeding established limit.

The sum of the environmental tax and payments for emissions (discharges) into the environment within the interval between the standard and the limit shall reflect socially required expenditures on their capturing and neutralization. If emissions (discharges) of these pollutants exceed the established limit, payment shall be five times as big as the previous one, and this will stimulate the realization of environmental programs.

Before a special research is performed, we would suggest that the environmental tax be established as amounting to 15 per cent of socially required expenditures on the capturing and neutralization of such hazardous pollutants.

In view of the adoption of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, greenhouse gases shall be separated into a special group, and payments for the emissions of those shall be established depending on the price on their emissions.

In the process of further improvement of environmental payments, a reasonable combination of integrated and individual indices of the hazardousness of pollutants shall be taken into account. First and foremost, this shall concern pollutants discharged with sewage.

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## PROSPECTS OF ENVIRONMENTAL INSURANCE DEVELOPMENT

Performing the functions of environmental risk management and ensuring indemnification of environmental damage caused to recipients by emergency environmental pollution, environmental insurance is an efficient mechanism for providing economic incentives and financial support to environmentally stable socio-economic development.

Today those responsible for causing environmental damage, as a rule, don't account for it, in spite of the fact that requirements regarding damage indemnification are specified in the Russian law, in the Federal Law "On Environmental Protection" (Article 18), in Articles 15, 454 and 457 of the RF Civil Code, in the Federal Law "On the Industrial Safety of Hazardous Manufacturing Facilities", and in about twenty other enactments. This happens not only due to the prevailing importance of business interests in manufacturing, but also because no conditions have been created, and no means have been suggested for making entrepreneurs economically interested in reducing environmental damage caused by their activities.

The absence of strict requirements for the indemnification of economic damage caused by environmental pollution creates an illusion with the investors that money should be invested only in the development of production. The ambiguity of the responsibility for the violation of the environmental law makes Western investors apprehensive, whereas Russian investors act carelessly, and when they are faced with the need to pay for the damage, this requirement causes an utter bewilderment, because in most cases there is no money to pay for the damage.

Neither the state, nor enterprises polluting the environment possess the means required for the prevention of environmental pollution, elimination and indemnification of its consequences. Response to an obvious question in such situation—where can this money come from?—can be found in the insurance ideology.

The need to establish the institute of environmental insurance is stipulated by: first, an urgent need in finding new sources of financing environmental protection activities; second, by the need to identify and distribute the responsibility for the damage among wrongdoers and, consequently, to personify the indemnification of losses to the sufferers; and, finally, by the possibility of providing methodologies and methods for the creation of instruments for providing economic incentives for reducing adverse environmental impacts.

Environmental insurance is the insurance of the civil liability of enterprises whose activities are the source of environmental risk. Environmental risk is a quantitative characteristic of environmental hazard that takes into account the consequences of its realization in the form of economic damage caused to recipients with a certain frequency.

Environmental insurance, as any other kind of insurance, covers only chance events, with their hazard characterized by the risk of their happening.

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A classic characteristic of insurance is the use of the well-known effect of risk dispersal in time and space. Paying insurance premiums whose amount presents no burden to the insured entity, it shifts the guarantee of the compensation of damages to a third party onto the insurer, the compensation being many times larger than the insured entity's premium. The insurer is interested in this because his income is associated with insured events of a probabilistic nature—as a rule, they don't occur at the same time and at the same place.

Environmental insurance creates a mutual economic interest of the insured and the insurer in reducing the risk of an emergency environmental pollution: for the insurer it means his income, and for the insured it means being able to compensate for damages to those who suffer from them and preclude accidents. The insured is economically interested in reducing the risk of environmental pollution, besides all other factors, due to the fact that insurance payments are reduced depending on the decrease of the probability of accidents.

Environmental insurance personifies the harm-doer and the recipient, which differs it from all other economic tools of nature management and environmental protection.

What is important in the environmental insurance, or, better to say, what it can't do without, is, first, to determine facility's environmental hazard, second, the risk of the realization of this hazard (environmental risk), and, third, the size of economic damage that the recipients may suffer if this environmental hazard is realized. Basing on these parametric characteristics of environmental insurance, tariff rates can be calculated, and the amounts of insurance payments for each facility can be established.

However, the principal institutional component of environmental insurance is, once again, the legal base required for ensuring the functioning of this eco-economic mechanism.

A number of federal laws contain innovations regarding environmental insurance; this problem was discussed in Russia at six conferences on this topic, and, as a result of these discussions, the Inter-Parliamentary Assembly of the CIS member-states adopted the model laws "On Environmental Insurance" (CIS IPA Decision No. 15-6 of June 13, 2000) and "On Obligatory Environmental Insurance" (CIS IPA Decision No. 12-11 of November 15, 2003).

Now the final step shall be made in the development of the environmental insurance institution—a Federal Law "On Environmental Insurance" shall be adopted, together with a package of normative/procedural documentation comprising methodologies for the calculation of economic damage due to emergency environmental pollution; the assess-

ment of the environmental hazard of enterprises and manufacturing facilities causing economic damage due to emergency environmental pollution; the calculation of environmental insurance tariff rates, and also directions and provisions on the formation of environmental insurance funds at the federal and regional levels.

Drafts of such documents have been developed at the RAS Market Economy Institute on the basis of studies conducted with the support from the Russian Foundation for Fundamental Research (Project No. 05-06-80245a) and the Russian Humanitarian Scientific Foundation (Project No. 06-02-00206a).

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## ON THE IMPROVEMENT OF TAX SYSTEM IN THE SPHERE OF SUBSURFACE RESOURCES USE

The eco-economic policy in the Russian Federation today shall provide conditions for economic growth while maintaining the country's natural resources potential by means of creating favorable conditions for the development of most environment-friendly sectors of the economy, changing the society's social orientation in favor of the preservation of the environment and refusal from some stereotypes of the consumer society.

Basing on this, a number of areas can be singled out within which activities aimed at the preservation of the environment should be taking place:

- The formation of an environment-oriented macroeconomic policy;
- Implementation of a structural policy aimed at maintaining economic growth by means of the development of the least environmentally hazardous, high-tech industries and enterprises;
- Improving the current systems of managing nature management processes, particularly of the tax system, in order to more comprehensively incorporate the natural constituent in the prices on finished products and promote efficient nature management.

Taxes can be regarded as one of the principal tools of pursuing an environment-oriented economic policy aimed at changing structural proportions in favor of the support of environmentally safe fields of activity. Practice shows that other administrative tools, as a rule, prove to be less efficient.

It is an important principle of an environment-oriented taxation policy that there should be a palpable tax load on all kinds of activity associated with active use of the natural resources potential and environmental damage, with reduced taxes for resource-saving activities. For example, an increase in investments into high-tech industries causing minimal damage to the environment can be encouraged by transition to a discriminating tax policy, when a partial immunity from taxation can be granted to enterprises or their units that introduce technological innovations, whereas tax load can be shifted to nature-exploiting industries.

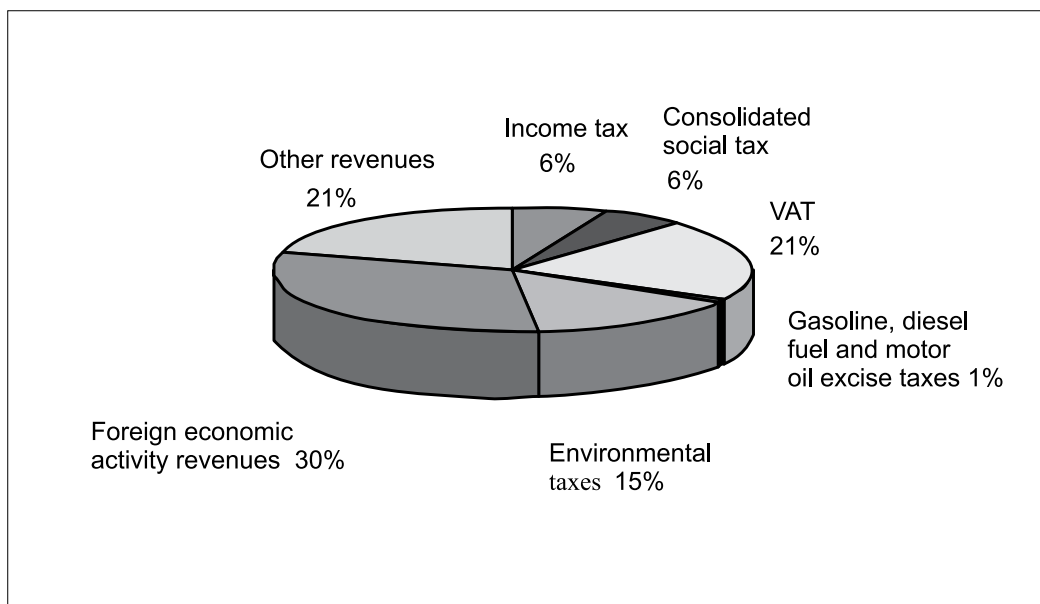
Certain conditions shall be met when pursuing an environment-oriented taxation policy:

- Specific amounts of tax rates shall be established only basing on a microeconomic analysis of their impact on the financial condition of enterprises;
- Enterprises shall be informed of any changes in the tax system in advance, so that they could develop their investment strategies with these changes taken into account;
- During the preparatory period reliable mechanisms shall be established for a justified calculation and collection of taxes. It's evident

**The idea that a preventive environmental protection strategy should be implemented shall underlie the state's environmental policy. With this approach environmental policy measures will be aimed primarily not at collecting compensations for existing environmental pollution or non-rational use of natural resources, and punishing the culprits, but at preventing the appearance of new pollution sources and providing incentives to economic players to use raw materials in more efficient ways.**



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that this approach, as well as the system of tax legislation as a whole, can function efficiently only under the condition that information on forthcoming changes is transparent and public, and key issues are widely discussed.

The improvement of the system that controls nature management processes shall be performed adhering to the principles of continuity and predictability of decisions being made. The idea that a preventive environmental protection strategy should be implemented shall underlie the state's environmental policy. With this approach environmental policy measures will be aimed primarily not at collecting compensations for existing environmental pollution or non-rational use of natural resources, and punishing the culprits, but at preventing the appearance of new pollution sources and providing incentives to economic players to use raw materials in more efficient ways.

It is important to ensure that environmental protection measures don't exert excessive financial pressure on industrial enterprises nor undermine opportunities for economic growth. In any event, environmental dues and taxes, as a tool diminishing economic activity, may be used only when the economy becomes overheated.

More often than not it appears to be more appropriate to transfer the center of gravity in the environmental policy to measures stimulating production, such as the partial exemption from taxes of the producers of manufacturing and waste treatment equipment allowing to reduce the consumption of raw materials and waste generation, or taxation privileges for the portion of profit that is obtained at an enterprise due to reducing the con-

sumption of raw materials and the generation of harmful exhausts with simultaneous growth of the volume of output, etc.

Some evident priorities exist in the area of improving the environmental taxation system. One of the most acute economic problems in Russia in recent years has been the appearance of structural disproportions associated with the accelerated development of extractive industries and the decrease of the competitiveness of the products of national manufacturing industries.

The structure of the Russian export is a sufficiently revealing indicator characterizing the role of the extractive sector in the Russian economy. In recent years the share of the export of mineral raw materials, first and foremost of oil and natural gas, in the structure of the Russian export, has amounted to 60 plus per cent (64.6% in 2005), whereas the share of machine-building products has amounted to mere 5.6% (in 2005). Accordingly, the major portion of hard currency obtained by the country has come from the export of mineral resources, and the volumes of hard currency receipts have depended on the situation on world markets of raw materials. Therefore, efficient use of the resources of minerals and raw materials is one of the most important macroeconomic issues.

From the state budget viewpoint, issues related to the use of the natural resources potential are no less important. In 2006 in the structure of state budget receipts the share of taxes collected for the use and in the process of the use of natural resources amounted to 15 per cent, 99 per cent of those being taxes collected in the sphere of the use of mineral resources.

Therefore, the very scope of the problem, that is, of the significance of the role of extracting industries in the Russian economy and in the state budget receipts shall arrest attention to this issue.

Meanwhile, problems exist in the development of extracting industries and in the taxation of this sector. On the one hand, the development of oil and natural gas production industries is believed to have reached a certain limit. Opportunities for the rapid growth of the extraction of mineral resources due to the use of capacities created back in the 80s that stayed idle in the 90s have been practically exhausted. No discoveries of new large oil-and-gas bearing fields are expected, whereas their incorporation into the economy might reverse the current trends. Most of newly discovered fields are either located in adverse natural and climatic conditions, or are of a relatively small capacity. In this situation many of existing problems can be solved by means of more efficient use of available resources, e.g. an integrated production of mineral resources, the incorporation of small fields into the economy.

However, problems in the taxation sphere impede the implementation of such strategy. The current taxation system is anti-environmental in many respects. The NDPI—the mining operation tax—is a classic example thereof. Today this tax is not differential and creates unequal competitive conditions to companies owning fields whose qualities differ. The tax rate depends only on the kind of produced raw materials: oil, natural gas, coal or crushed rock. As a result, the amounts of payments also depend on production volumes and the kind of raw materials only. The tax doesn't take into account the specifics of the company's fields, e.g. to what degree it has been exhausted.

This situation results in extremely unfavorable economic consequences. Such system eventually leads to selective depletion of minefields. Any producer of raw materials, just like any economy player, strives to obtain maximum profit. With the current taxation system it's the mining of large, high-grade deposits that ensures maximum profits. As for small or exhausted deposits, it proves to be less troublesome to put them out of use. Meanwhile, the selective use of deposits is considered a dead-end approach in the development of the extractive industry.

Experts have realized the problems associated with the need to improve the environmental taxation system long ago. For instance, the Russian Ministry for Natural Resources has repeatedly substantiated the need to differentiate the mining tax rate depending on mining and geological and economic conditions in which deposits are mined. They have tried to prove that a simple increase in the mining tax base rate won't solve the problem of

collecting the surplus mining rent from enterprises producing mineral raw materials, because for small, low-yield fields the current tax rate is excessively high already.

Evidently, it is the transition to a differentiated taxation system for extractive industries where the way to solve this problem should be sought. This will allow using mineral raw materials more efficiently and making the current taxation system more environment-oriented.

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## STRENGTHENING THE ENVIRONMENTAL FACTOR IN TOURIST AND RECREATIONAL ZONE DEVELOPMENT

In 1980s a well-known natural use economics school was created in Odesa. Its representatives, M.T. Meleshkin and V.N. Stepanov, analyzed the management of eco-economic relations within the "land-sea" system. Later on R.A. Kryzhanovsky, another representative of this school, developed approaches to sea management. The results of these efforts can be fully applied to ensuring a stable natural management and a balanced development of the coastal zone of the Black Sea coast of the Caucasus, in view of an intensive development of the area for recreational uses.

The development of this territory without sufficient consideration of the natural factor results in a conflict of goals and interests. The EU defines integrated management of coastal zones as a continuous process aimed at the implementation of the principles of sustainable development of coastal zones and the maintenance of their biological diversity. The World Bank defines it as a social process that establishes an administrative and legal framework required for ensuring the integration of plans for the creation and management of coastal zones, solution of environmental and social problems, and for getting all interested parties involved. In the Krasnodarsky Territory, for example, the following factors calling for the creation of such systems and management methods can be cited: a) the increase of the anthropogenic load on the coastal water area; b) the growth of competition between the users of natural resources found in coastal zones, and the existence of inter-agency conflicts; c) the emergence of conflicts between development plans and environmental protection goals. Among the principal environmental problems in the region's coastal zones are water pollution and the eutrophication of the marine environment, the destruction of natural landscapes in coastal zones, degradation of unique ecosystems, seacoast erosion, landslides, drinking water deficiency in coastal towns, natural and man-made emergencies, the reduction of the biological diversity in coastal zones, etc.

It is clear that the coastal zone is a unique natural system that needs special management techniques and special approaches to planning. Planning and management shall be performed with land and sea seen in their inseparable unity. The most acceptable type of coastal zone development is the one that is coordinated with the trends of natural processes development. For example, public discussions about holding the 2014 Winter Olympics in the Krasnaya Polyana are mostly not about the location as such, but about the issue of the coordination and harmonization of economic interests and the preservation of unique natural ecosystems present in the region. This presupposes taking into account the needs and interests of all parties using the territory's resources: enterprises, the populace, investors, local authorities, etc. The principal goal of territorial planning is the development of an integrated concept for a balanced, environmentally stable development of the territory, oriented at the development of its recreational potential, restoration and preservation of its natural capital, and the creation of long-term social and economic guarantees for the local populace.

The Krasnodarsky Territory branch of the Russian environmental protection agency Rosprirodnadzor with the Ministry of Natural Resources of Russia has dealt with cases of the violation of the environmental law and damaging the environment that happened during the use of recreational

**The implementation of environmentally sustainable development principles shall be carried out taking into consideration regional particular features, spatial aspects and the specifics of local nature management. This is important in view of the implementation in Russia of a number of projects for the development of tourist and recreational zones. Such zones are being created in the Altai, Baikal Region, Kaliningrad Oblast, Stavropolsky and Krasnodarsky Territories, etc.**

areas. Thus, for example, an inspection performed by environmental regulators discovered a number of violations of regulations governing the use of the territory of the State Landscape-and-Floristic and Sea Wildlife Preserve called Bolshoy Utrish during its use for recreational purposes. This preserve is located within the coastal line and the Black Sea water protection zone. In the course of the inspection it was found out that work had been started on the implementation of a project for the construction of a health and recreational complex within the preserve's territory without obtaining a positive conclusion from a state environmental expert review committee that would have reviewed pre-design and design materials. Administrative proceedings were started in view of this violation of the law. In spite of efforts that are being made to preserve the precinctive flora of the Mediterranean type, territory degradation processes are still underway. Therefore, during the development of projects for its economic and recreational use, construction sites should be placed on land plots in a way that would minimize damage to unique ecosystems that shall be preserved.

It has happened that, during the development of coastal recreational areas, construction has been performed with deviations from designs, without duly adhering to the requirements of environmental and town planning expert reviews. Besides, practice has shown that at the environmental impact assessment stage public opinion and the results of public hearings on certain environmentally sensitive projects have been taken into account only formally, and haven't effected the selection of the final management decision. It has happened that, during the construction of facilities in the coastal protected area and the water protection zone of the Black Sea, the environmental law has been violated, and the construction has been carried out without obtaining permitting documents and the results of a state environmental expert review. As the experience of the Krasnodarsky Territory Directorate of the Federal Service for state oversight in the nature management sphere demonstrates, when a facility has been built with violations of the requirements of the environmental law, e.g. without a required environmental expert review, procedures of the environmental audit shall be applied in order to verify whether activities under review meet environmental norms, rules, etc.

Other examples of environmental law violations have been discovered: construction in the water protection zone, without proper environmental justification and permitting documentation, of boathouses for storing sea-going boats, cafes, mini-hotels, roads, docks; resources were used without obtaining proper licenses, e.g. the production of subsurface therapeutic and drinking mineral waters, etc. In recent years a negative trend has emerged: under various pretexts coastal territories are removed from public use with the intent to make them private. An analysis shows that the majority of populated areas along the coast lack proper systems for treating sewage and waste waters flowing

into the Black Sea basin. According to data contained in the State Report "On the state of the environment and environmental protection in the Russian Federation in 2005" the Adler/Sochi area is characterized by steady pollution with petroleum products, a steady excessive BOD5 and an unstable, unfavorable oxygen regime, especially in the bottom water layers. Water in the Adler/Sochi area and in the Sochi basin may be classified as "moderately polluted". Presently along the coast the method of the deep-water release into the Black Sea basin of treated waste waters is employed. However, due to inadequate treatment facilities, especially in summer, and their inefficient operation, said waters are released into the sea with pollutant content exceeding established norms (maximally allowable pollutant content). No systematic studies of such deep-water waste releases have been performed.

The increase in the anthropogenic load on coastal areas makes it necessary to improve legislation governing the management of specially protected coastal areas, to take into account the growth of competition between users of the natural resources of coastal areas and existing inter-agency conflicts, to resolve conflicts between the goals of the economic development and environmental protection goals, to ensure that Russia fulfils its international obligations on the safeguarding the Black Sea from pollution. For example, a problematic environmental situation has been formed at the Anapa resort, resulting both from the increase in traffic intensity and insufficient attention paid by local administrative bodies to the solution of environmental problems. The time has come to take measures to preclude the risk of the anthropogenic factor's impact on the unique environment of the region. The town doesn't even have a general layout, therefore there is no town planning concept for the resort development, there is no zoning layout which results in a chaotic development of the resort's area, in allocating land plots for construction within areas not suited for intended purposes, in increasing anthropogenic load on unique natural complexes of the resort in general. Besides, it has happened that land plots have been provided for the construction of facilities for small resort business on the lands of specially protected territories (within the resort's sanitary protection zones, water protection zones, mountain-sanitary protection districts and in other protected areas) in violation of the established regime of their protection. A similar problem exists in Novorossiysk—a complex of measures shall be implemented there to adjust town planning activities with environmental protection factors taken into account.

There is another example of social infrastructure facilities adversely impacting the environment. Thus, the rescue station located within a specially protected territory of the Sudjukskaya Laguna natural memorial (in the vicinity of Novorossiysk) is located in the Black Sea protected coastal area, practically on the water's edge. According to Article 27 of the Land Code land plots located within this territory are subject to certain restric-

tions and shall not be made private, except cases stipulated by federal laws. Specially protected territories are those lands that are valuable from the point of view of environmental protection, science, history and culture, aesthetics, recreation, health, etc.; they are, fully or partially, removed from economic use by acts issued by federal authorities, state authority bodies of subjects of the Russian Federation or by decisions made by local self-government bodies, and enjoy a special legal regime. According to Novorossiysk State Council of People's Deputies Decision No. 328 dated June 29, 1979, Sudjukskaya Laguna (with its spit) is recognized as a natural memorial. As such, it enjoys a special protection regime established for the territories of natural memorials and their protected zones, within which any activities resulting in violations of the integrity of natural memorials are prohibited.

The participation of citizens, local populace in making important managerial decisions plays an important part in the formation of environmentally sustainable development in a region. Thus, citizens of Novorossiysk initiated an inspection by an inter-regional group of the Krasnodarsky Territory Directorate of Rosprirodnadzor to verify if the environmental law is observed in Tsemesskaya Roshcha. In 1979 it was classified as a natural memorial by a decision of the Executive Committee of the City of Novorossiysk. A preserve-area botanical regime was established within a territory occupying 150 hectares; the wooded area is a part of the wood fund of the Novorossiysk forestry and is included in the regional cadastre of specially protected territories as a natural memorial of a regional importance.

Today Tsemesskaya Roshcha is, so to speak, a "fragment" of the primary bottomland forest of the Tsemess River. It's the only existing part of a unique ecologic community existing in the conditions of elevated humidity, practically in the downtown part of an industrialized city. The trees there are characterized by high growth class and completeness. The first tier is predominantly presented by European ash, oak, rattler tree. The second tier is presented with pear tree, Tatarian maple, common maple, European hazel, hawthorn, red dogwood, silk vine. Among herbs there are many precinctive and specially protected varieties, such as corydalis, rare varieties of ferns, summer snowflake, etc. There is a reservation of Caucasian carabus, common stag beetles and other fauna representatives found into the Russian Red Book and the Krasnodarsky Territory Red Book. It's clear that the unique ecosystem of Tsemesskaya Roshcha won't be able to bear an increased anthropogenic load associated with additional development of adjacent territories and increased impact on any of ecosystems that have been formed in this natural memorial. A territory currently used as a tree and flower farm borders the wood. When the plot for the farm was being selected, the natural high humidity factor was taken into account, along with geographic zoning and the needs of city landscaping. Therefore, the proposed removal of the of the farm

(the citizen's concern) and non-environmental use of this territory may well result in losing unique results of people's work, planting stock may be lost, city landscaping activities may be reduced in scope, which is inadmissible. Placing here industrial facilities producing a significant adverse environmental impact, may lead to breaking ecological interrelations, result in the death of rare and vanishing plants, animals and insects that are universally protected by the state and registered in the Red Book. Presently, within the framework of public hearings at the local level and people's cooperation with environmental protection authorities, a model is being formed for managing sustainable nature management in a city.

Generally speaking, the conflicting type of nature management model has been formed in the region, meaning that the interests and needs of various land use participants may not coincide. An example of this is the intensive construction of cottages on lands suitable for agriculture, e.g. for viticulture in the vicinity of the town of Dyurso. Besides, the activities of such entities as the Caspian pipeline consortium, including its long-distance pipelines and the sea terminal, call for implementing a number of measures aimed at increasing environmental safety during the production and transportation of oil and petroleum products over farming lands and woods, specially protected natural territories, water basins, along with measures aimed at waste treatment, reclaiming damaged and polluted soils, etc.

The implementation of measures aimed at strengthening the environmental factor in the development of tourist and recreational zones, including such procedures as environmental expert review, ecological audit, improving the environmental regulation of economic activities, perfecting the system of environmental payments, etc. is aimed at reducing conflicts of interests, increasing the investment appeal of projects and the region in general, creating incentives for a transition to environmentally-oriented methods and decision-making models, preservation of unique natural resources in view of the needs of future generations.

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## AUTOMOBILIZATION: WHO WILL PAY THE BILL?

The invention of the internal combustion engine in the XIX century radically changed man's way of life. A number of factors promoted the rapid development of the automotive transport: high speed and cross-country capability, maneuverability, comfort in travel, ease of control. As people's welfare grew, cars became more affordable. This significantly widened people's ability to look for new places to live, work and study, the geography of people's recreation also expanded. Today passenger cars comprise 86 per cent of the total number of automobiles in the world, and the overwhelming majority of those satisfy personal travel needs.

However, at a certain stage the increase in personal mobility results in changes in the society's values and a qualitatively new lifestyle, oriented at the use of the car. This phenomenon is known as "automobile dependency". Automotive dependency is a self-reproducing phenomenon. As other transportation means become less available, an increasing number of citizens are forced to purchase cars, thus reproducing all problems associated with automobilization, but at another level. According to some estimates, the automobilization level of 380 cars per 1000 people is the threshold level for the transition to automobile dependency<sup>1</sup>.

The quality of life in automobile-oriented cities goes down. The dominance of the car in the streets creates psychological stresses due to bottlenecks, the lack of space for safe walking (sidewalks are used for parking, whereas streets with heavy traffic create the so called barrier effect), public transport degrades. This picture is aggravated by high levels of air pollution and environmental degradation. The share of automotive exhausts in the total air pollution in large cities amounts to 90 to 95 per cent, and, as it has been proven, is a major cause of the high sickness rate in the cities. Economic losses due to air pollution produced by automobiles are estimated as up to 2 per cent of the GDP.

In practically all developed countries efforts are being made to find a way to break the vicious circle of the automobile dependency. To do so it is important to understand why, in spite of all the downsides (bottlenecks, air pollution, etc.), people still choose the private car for travel, and what is the relation between personal preferences in choosing transportation means and public interests.

Today's economics has proved that each additional car on the road means additional costs to the society (the tear and wear of the road infrastructure, increased risk of accidents, time lost by other people on the road, environmental pollution costs, etc.) that the driver doesn't even consider nor pays for. The so called negative external costs, or external effects come forth. Contemporary studies have shown that the external costs make up from a quarter to one third of the sum of costs produced by an average car.<sup>2</sup> An estimate exists of the amount of such costs per an average car in Russia—about 2.2 rubles per kilometer.

**The process of rapid automobilization in Russia began later than in the developed countries. However, even today the Russian cities can observe the full scope of the negative consequences of high automobilization levels (bottlenecks, high pollution levels, high road incident rates). Environmental management of the automotive transport in the developed countries includes a wide spectrum of mechanisms, and instruments designed for reducing mobility using private vehicles occupy an important position among such mechanisms. This article discusses these instruments.**

<sup>1</sup> Golts, G.A., Road Complex in the Explosive Automobilization Environment: Trends, Patterns, Forecast, Forecasting Problems, No. 4, 2002

<sup>2</sup> Transportation Cost and Benefit Analysis, [www.vtpi.org](http://www.vtpi.org)

The experience of developed countries shows that it is impossible to maintain the balance between the supply and demand for private vehicle use by means of increasing the traffic capacity only. A modern strategy of transport development shall be oriented at the movement of people, and not of their private cars. This calls for an extensive development of public transportation means, in combination with various forms of limiting travel in private cars.

Mobility management presupposes a wide use of economic instruments that convert external costs into internal costs carried by persons driving their private vehicles. What is the way to achieve this?

In practice two approaches have been implemented:

- 1) setting certain environmental standards on vehicles and used fuel;
- 2) imposing various types of taxes on the users of private vehicles.

Historically, the system of standards was the first to be employed. As a result of the introduction of environmental standards in the developed countries, the environmental class of vehicles presented on the market changed. Creation of an efficient system for the monitoring of vehicles' environmental parameters in the process of their operation was supplemented with accountability assurance measures, applied to both producers (vehicle withdrawal) and vehicle owners (fines), which have made both try to meet established requirements.

The purpose of vehicle taxation is to make the owner of the vehicle pay for the costs caused by vehicle operation and incurred by the society. In order to do so the tax shall reflect the vehicle's weight, location and time of its operation, the mileage. Since 2005 in Germany they have been monitored in the actual tracking mode. However, in most countries vehicle taxation includes a number of various taxes, each reflecting one of the above indicators. The following types of taxation are employed:

- 1) vehicle taxation;
- 2) fuel taxation;
- 3) road pricing;
- 4) congestion pricing;
- 5) parking fees.

### **Vehicle taxation**

Vehicle taxes aim at reducing the demand for vehicles. The tax is applied to all vehicles in a country, regardless of their actual mileage. The tax is in use all around the world, and usually is differentiated by vehicle type, vehicle price, emission and noise levels, etc. Revenues from vehicle taxation in Germany, for instance, amount to 1.5 percent of the state budget.

**Fuel taxation** offers a way to charge the users of transport infrastructure variable infrastructure costs proportionally to the individual infrastructure

use. Besides, taxation of traditional fuels—gasoline and diesel fuel—provides incentives for transition to cleaner types of fuel and the diversion of passenger and cargo traffic to more environmentally-friendly types of transport (railroads, river transport). Fuel taxation, however, is not without limitations. Firstly, demand for traditional fuels is not flexible (an increase in fuel prices doesn't result in a corresponding reduction in demand), and, secondly, such taxes can't be differentiated by location or time of car use.

The motor fuel taxation rates depend on the energy policy pursued by the country. In most developed countries motor fuel taxes are formed largely on the basis of economic criteria: taxes on higher quality fuels are lower, which makes refining companies more interested in producing fuels of higher environmental grades. In 2000 the fuel tax in Germany amounted to 7 per cent of the state budget. The use of tax revenues for the satisfaction of social needs created a positive public attitude towards the tax.

### **Road pricing**

Charges for road use (toll) can be differentiated by time of the day or car type, it can be applied to the overall road network or particular roads. Road pricing is normally applied to congestive roads, therefore in a sense it can be viewed as congestion pricing. Road pricing should not be too high, as all traffic may switch to country roads and damage the environmental situation there. Road pricing can be used for supporting transportation activity of low-income strata of the population or for subsidizing public transport, so that road charges don't become an "isolation tax". Sometimes one lane is priced lower, to be used by cars with two or more passengers, or vehicles of a high environmental grade (e.g. hybrid vehicles).

Even the introduction of road pricing at the level of reimbursing internal costs of the transport infrastructure allows to commercialize the use of the road infrastructure.

### **Congestion pricing**

These fees are collected for the use of transportation systems in cities with intensive traffic. Their purpose is to reduce the use of private and cargo vehicles in the cities. The principal forms of such fees are congestion pricing, area licensing, cordon pricing; vignettes schemes – a fee for temporarily accessing certain road networks over certain periods of time; electronic road pricing.

Singapore is a textbook example of an efficient transport policy. This country employs electronic road pricing, cordon pricing, and the Vehicle Quota System. Besides, there is an annual vehicle tax. Electronic road pricing devices consist of two elements: a card (similar to a credit card) installed in the vehicle,

Table. Instruments for the management of private car use demand.

Type of incentive or disincentive	Possible Economic Instrument(s)	Selected Economic Measure(s)
- Discourage motorized vehicle ownership	- tax/charge on vehicle purchase/ownership/scrappage	- annual vehicle tax - registration tax/charge - (re)sales tax/charge - scrappage tax/charge
	- restricting the number of vehicles and/or new registrations	- auction schemes, competitive bidding for new licenses - licensing car ownership
- Discourage motorized vehicle use; - Encourage switch to public or non-motorized transport	- tax/charge on vehicle use	- fuel tax - pay-at-the-pump (sur)charges - tax on vehicle distance traveled
	- tax/charge on road and/or infrastructure use; - restricting access to urban centers or special areas	- parking fees - city tolls - road pricing - bridge tolls - cordon pricing - congestion pricing
	- subsidies for public transport	- subsidies for public transport fees - subsidies for public transport networks - and operation tax-deductible public transport expenses - P&R schemes
- Encourage introduction of low-emission technologies and innovations	- taxes/charges on vehicle purchase/ownership/scrappage; - taxes/charges on vehicle use; - taxes/charges on road and/or infrastructure use	- tax differentiations based on emissions - carbon/energy taxes - emission fees - emission-based surcharges - subsidies, tax rebates for low emission vehicles/technologies

Source: Economic Instruments for Sustainable Road Transport. An Overview for Policy Makers in Developing Countries, GTZ GmbH, www.gtz.de

and street antennas. The payment system is differentiated by roads, vehicle types and sizes.

**Parking fees**

A universal introduction of parking fees (provided that street parking is prohibited) can, to a large extent, stimulate the populace to switch to the use of public transport and, to an extent, reduce congestion in the cities. The “park and ride” system becomes increasingly popular, when inexpensive parking space is provided on the city periphery, and further transportation is on the public transport only.

Each taxation category impacts the public demand for private car use differently. For example, the car purchase tax and the registration fee may influence the number of purchased cars, but they don’t have any effect on how these cars are used. Fuel taxes, on the contrary, make car rides more expensive and stimulate drivers to switch to more fuel-efficient driving patterns. However, they don’t reflect the location nor the time of travel (rush hour in a city or a deserted country road).

Summing up: the transport taxation system provides a way for reaching certain economic, environmental and social goals, influencing people’s transport behavior and covering transportation costs. Instruments for managing automotive transport demand are presented in the Table.

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# ANALYSIS OF SOME SUSTAINABLE DEVELOPMENT INDICATORS IN THE TOMSK OBLAST

**Sustainable development indicators should reflect economic, social and environmental aspects of the satisfaction of the needs of the current generation, and should not limit future generations' ability to satisfy their own needs. Development can be considered sustainable if it occurs taking into account the achievements of the economic growth with necessarily ensured reasonable balance between the need of the society to improve the quality of life and a policy aimed at preventing environmental degradation [1].**

**Sustainable development indicators for the Tomsk Oblast were developed in 2003 under the "Development of Indicators for the Assessment of the Sustainability of the Economic and Social Reform Process in the Russian Federation." The work was performed by the ERM British consulting firm with financial support provided by the UK Department for International Development under an order from the Russian Ministry for Economic Development and Trade.**

The set of sustainable development indicators generated for the Tomsk Oblast is the first Russian regional system of interconnected integrated indicators of environmental, social and economic development of a region.

One of them is the "Natural Capital" sustainable development indicator included into the system of reference indicators of the Program of socio-economic development of the Tomsk Oblast for the years of 2006-2010. According to our estimates [2, 3], the natural capital amounted to 822 592 mln rubles in 1999, and 3 958 887 mln rubles in 2005, which testifies to an increase in the exploitation of natural resources.

The natural capital of the Tomsk Oblast consists mostly of deposits of hydrocarbon raw materials (about 98 per cent). The last three years have seen a negative dynamics in the stock addition to oil production ratio (depletion). Due to insufficient financing, exploration work doesn't make up for the depletion of deposits of valuable hydrocarbons whose exploitation provides a tangible portion of the revenues of the oblast budget. Depletion of oil and natural gas deposits can create grave problems for the region's socio-economic development. The fact that hydrocarbon production leaves the stock addition behind testifies to resource depletion and calls for taking more energetic steps aimed at increasing stock addition.

Today the growth of the economic value of non-wood resources is observed. Their share in the natural capital has increased four-fold as compared to the year of 1999. To a large extent, this growth has been facilitated by the activity of enterprises harvesting wild non-wood products, as they create jobs and additional income sources for local citizens. Investments made by such companies in the years of 2004-2005 resulted in the creation of a fairly strong complex for the harvesting and processing of wild-growing non-wood products. According to data collected by the Tomsk Oblast Administration's Consumer Market Department, in 2005 enterprises produced 3 280 tons of mushrooms, 4 093 tons of wild berries, and 3 800 tons of wild nuts. The exploitation of non-wood resources is non-depleting. However, the sites of the mass growth of mushrooms and berries should be preserved in order to keep up their stocks in the interests of local citizens, for whom wild-growing plants are a source of additional income.

In 2005 the natural capital still was ten times as big as the physical capital, which shows that the Tomsk Oblast development remained non-sustainable. This is also proved by the dependency of the regional economy on the condition and exploitation of local natural resources, in particular, on the fuel and energy resources. Those advantages that the Tomsk Oblast has due to its deposits of hydrocarbons will exist as long as these deposits last. In the long term, such development of the region can't be considered sustainable. Therefore, priority should be given to investments in the human capital, its maintenance and quality improvement, i.e. education and science. Also, investments in geological prospecting, in the expansion of the use of renewable natural resources, and in the deep processing of natural raw materials are required.

The dynamics of the "Total pollution per GRP unit" sustainable development indicator are positive. In 2005 it amounted to 3600 tons per billion rubles, whereas in 2004 it amounted to 5170 tons per billion rubles

Table 1. Dynamics of the Tomsk Oblast Sustainable Development Indicators

Indicator	Application Sphere	Unit	2002	2003	2004	2005
Key Indicators						
Gross Regional Product (GRP) per capita	Economic	Thousand rubles per person	76,3	99,1	141,5	177,4
Gross Regional Product (GRP) per capita, Russia	Economic	Thousand rubles per person	74,6	91,9	118	151
GRP Energy Intensity	Economic	Tons (equivalent fuel) per thousand rubles	0,05	0,047	0,034	0,027
GRP Energy Intensity, Russia	Economic	Tons (equivalent fuel) per thousand rubles	0,14	0,12	0,1	0,08
Total Pollution per GRP Unit	Economic	Tons per million rubles	30	9,9	5,17	3,60
Amount of Unprocessed Industrial and Household Waste	Economic	Thousand tons	494,3	480,4	256	203
Supplementary						
Natural Population Growth	Social	Per 1000	-3,9	-3,9	-2,8	-3,8
Natural Population Growth, Russia	Social	Per 1000	-6,5	-6,2	-5,6	
Life Expectancy	Social	Year	65,49	64,83	65,36	65
Life Expectancy, Russia	Social	Year	65,29	64,82	65,3	
Investments into the Basic Capital Aimed at Environmental Protection and Rational Use of Natural Resources	Environmental	Thousand rubles	635160,3	461288,9	758913,6	188917,6
Natural Capital	Environmental	Million rubles	N/A	1911104*	2516904*	3959149
Pollutant Emissions into the Atmosphere, total	Environmental	Thousand tons	285,8	318,46	279,625	265,584
Polluted Wastewater Discharge, total	Environmental	Million m <sup>3</sup>	18,93	17,79	16,87	11,94
Oblast-Specific Indicators						
Use of Prescribed Cut	Environmental	%	5,7	5,8	6,2	5,9
Oil Deposits Depletion	Environmental	Million tons	-201	-7673	-11332	-7018

\* - approximate

Source: the Table was generated basing on data provided by the Administration of the Tomsk Oblast, the Oblkompriroda Directorate and the Tomsk Oblast Territorial Office of the Federal State Statistics Service.

Table 2. Sustainable Development Indicators Employed for Monitoring the Tomsk Oblast Socio-Economic Development Program

Tomsk Oblast Socio-Economic Development Program Goals	Tomsk Oblast Sustainable Development Indicators		
	Key	Supplementary	Oblast-Specific
High level of business activity	<ul style="list-style-type: none"> <li>• Production of commodities by the small business</li> </ul>	<ul style="list-style-type: none"> <li>• Ratio of small business employees to the region's economically active population</li> </ul>	
Efficient and balanced economy	<ul style="list-style-type: none"> <li>• Share of innovative products shipments in the total volume of industrial products</li> <li>• Capital assets volume index*</li> <li>• GRP per capita*</li> </ul>	<ul style="list-style-type: none"> <li>• Capital assets renewal ratio*</li> </ul>	
Investment Appeal			
Economy Internationalization			
High-quality labor resources	<ul style="list-style-type: none"> <li>• Unemployment level</li> <li>• Human potential development index*</li> </ul>	<ul style="list-style-type: none"> <li>• Natural population growth</li> <li>• Life expectancy</li> </ul>	
Developed infrastructure			
Favorable conditions for life, work, rest and raising children		<ul style="list-style-type: none"> <li>• Poverty rate</li> <li>• Amount of paid services per capita</li> <li>• Real disposable incomes</li> <li>• Number of registered crimes</li> <li>• Life expectancy</li> <li>• Children's mortality</li> <li>• Common sickness rate</li> <li>• Cancer rate</li> <li>• Mean age*</li> <li>• Purchasing power of incomes and wages*</li> </ul>	<ul style="list-style-type: none"> <li>• Tick-borne encephalitis sickness rate</li> <li>• Lyme disease sickness rate</li> <li>• Opisthorchiasis sickness rate*</li> </ul>
Efficient executive power	<ul style="list-style-type: none"> <li>• Budget sufficiency*</li> </ul>		
Favorable environment		<ul style="list-style-type: none"> <li>• Emissions into the atmosphere, total</li> <li>• Polluted wastewater discharge, total</li> </ul>	
Rational use of the natural capital	<ul style="list-style-type: none"> <li>• GRP energy intensity</li> <li>• Investment into the basic capital from all financing sources</li> <li>• Real savings</li> <li>• Total pollution per GRP unit</li> <li>• Amount of unprocessed industrial and household waste</li> </ul>	<ul style="list-style-type: none"> <li>• Area of specially protected wildlife territories</li> <li>• Investment into the basic capital aimed at environmental protection and rational use of natural resources</li> <li>• Natural capital</li> </ul>	<ul style="list-style-type: none"> <li>• Use of prescribed cut*</li> <li>• Oil Deposits Depletion</li> </ul>

\* - Sustainable development indicators not incorporated into the Program as indices

(See Table 1). This shows that natural resources production and processing enterprises and technologies became more environment-friendly, treatment facilities began operating more efficiently, and production became less energy-consuming.

The "GRP Energy Intensity" sustainable development indicator demonstrates that the energy intensity of the gross regional product keeps going down. Besides, the value of this indicator in the Tomsk Oblast is significantly lower than the average in Russia. The continuing reduction of the energy intensity of the gross regional product speaks of the reduction in the consumption of natural fuel resources and products of its processing, first of all, due to the use of energy saving technologies.

The amount of the reduction in the value of this indicator characterizes the decrease in the intermediate consumption of the gross regional product and, respectively, of the growth of the added value of the end product. With further introduction of techniques for deep processing of natural fuel and up-to-date technologies, this trend is likely to continue.

The "Investments into the Basic Capital Aimed at Environmental Protection and Rational Use of Natural Resources" sustainable development indicator demonstrates a negative development trend in the evolution of this indicator in 2005 due to a decrease in the total financing of nature-conservative measures by the oblast budget and enterprises. Should this trend continue, this reduction (more than 3.5-fold as compared to the year of 2004) will produce a negative impact on sustainable development indicators (such as "Total Pollution per GRP Unit", "Pollutant Emissions into the Atmosphere", "Polluted Wastewater Discharge"), and on a number of indicators of the Program of the Socio-Economic Development of the Tomsk Oblast. Continuation of this trend will worsen the environmental situation and may result in a non-sustainable development of the region, and the impossibility of fulfilling the Program in full scope. In order to prevent this variant of the region's development from happening, next year investment shall be raised to 4 per cent of the investment into the basic capital.

The "Use of Prescribed Cut" sustainable development indicator shows that the level of the development of prescribed cut remains low, amounting to 5,6 per cent [4, 5]. Coniferous woods prescribed cut is used at the rate of 12.8 per cent. Fine firwood is being logged, whereas low-value overage woods are being accumulated on a large scale, which reduced the overall value of forest resources. The evolution of this indicator demonstrates that the timber industry remains underdeveloped and doesn't bring substantial revenues. The region should be developing wood processing enterprises.

The above indicators have been successfully incorporated into the decision-making scheme, and permit to keep track of positive and negative trends in all spheres of society's activities. They are also used

in the planning of activities aimed at maintaining sustainable development and the elaboration of a respective policy.

These indicators conform to the strategic goals of socio-economic development. Most of sustainable development indicators (75 per cent) are used as indicators and indices for the evaluation of progress achieved in the fulfilling of the Tomsk Oblast Development Strategy for the period of up to 2020, and of the Tomsk Oblast Socio-Economic Development Program for the period of up to 2006-2010 developed by the Administration of the Tomsk Oblast in 2005 (Table 2).

Today sustainable development indicators are employed for the monitoring of the implementation of the socio-economic development program. Collected data are used for preparing proposals on revising the program's goals and activities that are submitted to the Tomsk Oblast administration.

Unfortunately, not all of important sustainable development indicators have been incorporated as indices into the program (e.g. the gross regional product per capita, the capital assets renewal ratio, the human potential development index, etc.). Some of the program's goals (the region's investment appeal and the internationalization of the economy) lack sustainable development indicators to be used as indices. All this makes the perfecting of the sustainable development indicator system and its use in the interests of the region's sustainable development necessary and accomplishable.

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## ECO-ECONOMIC ASSESSMENT OF INVESTMENT PROJECTS

The Ecological Information Agency was established in 1995. Today our Agency not only disseminates ecology-related information, but mostly engages in performing environmental assessments of various investment projects, both planned and being implemented.

Our experience has shown that, in spite of constant declarations made by authorities at all levels regarding their increased attention to environmental safety and protecting the citizens' right to a favorable environment, the assessment of environmental risks is performed only after all principal decisions have been made. It rarely happens that the evaluation of the economic performance of projected activities is performed with due regard for environmental damages. Selection of alternatives more often than not is made basing on direct economic costs. Projects presented for state expert reviews at best contain the Environmental Impact Assessment (OVOS) or "Environmental Protection" sections, the latter containing evaluations of the so called "averted environmental damage", because no eco-economic assessment methodologies have been legally approved in Russia so far, in spite of the fact that the law requires that they should be performed as part of economic activities planning process. Only one agency-level methodology has been approved at the federal level, the "Provisional Methodology for Averted Environmental Damage Assessment". It was approved by the RF State Committee for Ecology on March 9, 1999. However, this methodology, though frequently used for the preparation of the OVOS and Environmental Protection sections of design documentation, can provide information on nothing more the environmental protection effect from the implementation of planned environmental protection activities and programs without taking into account the whole specter of potential environmental damage and residual impacts. This methodology was developed for a rather narrow use—"... evaluation of the activities of environmental protection agencies of the State Committee for Ecology of Russia"—and doesn't permit project developers to deal with a wider circle of planning, design and administrative problems. Besides, this methodology has a number of considerable drawbacks, even if it is only used for the evaluation of the activities of environmental protection agencies:

- The indices of specific damage from air pollution are understated, in comparison with similar indices for water pollution;
- The elevated health hazard from automobile exhausts is not taken into account, in comparison with the exhausts of same pollutants from stationary sources, just as the amount of damage resulting from the pollution;
- The index of specific damage from waste disposal is significantly understated, due to the low value of the mean index of the specific amount of waste per one hectare of land used for waste disposal, in comparison with the real index;

**Our experience has shown that, in spite of constant declarations made by authorities at all levels regarding their increased attention to environmental safety and protecting the citizens' right to a favorable environment, the assessment of environmental risks is performed only after all principal decisions have been made.**

- When the amount of the averted (caused) damage is being evaluated, the elevated hazard of waste disposal at non-authorized dumps (as compared to authorized ones) is not taken into account;
- The air pollution damage caused by the blowing of suspended solids from dumps of overburdens and closing strata is not taken into account;
- Double counting occurs when determining the amount of damage caused by the disposal of industrial and household wastes: directly from waste disposal and from the degradation and pollution of soils by chemical compounds as a result of waste disposal;
- The most important local damage-generating factors are not taken into account, such as the background environmental pollution by specific compounds.

The Ecological Information Agency has performed macroeconomic assessments for the development of the environmental policy concept, sustainable development indicators and the assessment of past environmental damage for the Kemerovo Oblast, it has also performed eco-economic evaluation of the efficiency of investment projects for the construction of industrial facilities.

During the performance of such evaluation we employ methodologies recommended by the World Bank [1-7].

In recent years the RUSAL Company has been our largest and constant client. Under orders from this company, we have performed environmental impact assessments (OVOSs) of new construction projects—not only in accordance with the requirements of the Russian law, but in accordance with the requirements of the International Financial Corporation, too. As part of these activities, we perform an eco-economic evaluation of the efficiency of investment projects at the national, regional and local levels.

The evaluation is performed in accordance with methodological recommendations regarding the performance of eco-economic evaluation of the efficiency of projected economic activities, developed in 2003 by professor, Doctor of Economics O.E. Medvedeva (Moscow) under an order from the Department of State Environmental Expert Review with the Russian Ministry of Natural Resources. These recommendations have been presented in a number of publications [8-10]. These recommendations define the eco-economic efficiency of a project as the “indicator characterizing the correlation between total economic benefits from the project and losses associated therewith, including external environmental effects and socio-economic consequences thereof that infringe on the interests of citizens and future generations and are caused by the implementation of the

project. The indicators of eco-economic efficiency are, in fact, indicators of the social efficiency of the project under consideration, as they deal with social effects and environmental damage associated with them. The evaluation of a project’s eco-economic efficiency is performed basing on the traditional cost-effectiveness economic analysis approach”.

The following factors are taken into consideration when performing such evaluation:

- The cost of natural resources likely to be lost or impaired;
- The cost of damage abatement (including health damage), restoration or reproduction of resources;
- Lost profit and other losses;
- Economic, environmental and social benefits.

The practice of the use of eco-economic assessments of projects’ efficiency has shown that, from the social efficiency viewpoint, benefits from the implementation of industrial projects are greatest at the national and regional levels, as that’s where the largest portion of benefits is accumulated, while all of the environmental damage stays at the local level to be dealt with by municipal authorities. The lesser amount of local economic benefits resulting from project implementation is explained by the current practice of the distribution of tax revenues among various levels of the Russian budgetary system. Today all taxes collected from entities’ incomes go to the federal (0,175) and regional (0,65) budgets, whereas revenues from property taxation go to the regional budget. At the same time, these taxes are principal ones and make up the principal supply of benefits from investment projects. The local budget receives only the land tax and a portion of the income tax. However, the amount of these taxes is significantly smaller than that of taxes levied on the profits and the property of enterprises that make up municipal budgets today. The existing situation with the distribution of taxes is a result of changes in the tax legislation made in 2004 after the adoption of the Federal Law No. 95 dated July 29, 2004 “On the Introduction of Changes into Parts I and II of the Russian Federation Tax Code”.

However, the use of the eco-economic evaluation in the analysis of alternatives permits to select a project that would be the most beneficial to the local community. Basing on the specific structure and damage assessment, target compensatory activities for the municipal level can be worked out (it’s for this level that damage is predicted). In accordance with international standards of the preparation of investment projects, it is the project initiating party that shall, basing on the results of such assessment, develop a plan of the abatement of residual impacts, compensatory payments and environmental management.

Due to the uneven distribution of tax revenues among various levels of the budgetary system, we would recommend employing such assessments during the shaping of local budgets—for justifying requests for additional financing from the regional and federal budgets for the implementation of programs on citizens' health and town environment quality improvement.

Also, we would recommend, for the regional budget development stage, providing for additional financing of municipalities from regional budgets, employing for this purpose a part of revenues from profit taxes coming from the implementation of investment projects, because it's the municipalities that bear all losses resulting from negative impacts, whereas the larger portion of benefits go to budgets at other levels.

In spite of declarations contained in legislative acts, no environmental damages are reimbursed in Russia today. Environmental payments for environmental pollution that budgets receive from enterprises using natural resources, do not compensate for the damage. Besides, current laws don't require that they be used for the financing of environmental protection activities.

The situation is aggravated by the fact that recent changes in the Russian law, called for by the need to bring it in concordance with Article 48 of the RF Civil Code and aimed at accelerating and simplifying the process of the preparation and expert review of project pre-design and design documentation, removed the environmental impact assessment and environmental protection sections from the required scope of documentation; today project developers are required to present only a "List of Environmental Protections Measures". Preparation of such list no longer requires the investor to produce and present to the public and state review committee an assessment of potential adverse impacts, prove the acceptability of the potential impacts and the sufficiency of planned measures. Consequently, the state and enterprises no longer carry any responsibility for future environmental and health damage caused by economic activities.

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