Best available technologies and their role in solution of environmental problems

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Abstract. The modern State task in the area of environmental security is primary. The basis of State policy in the sphere of Ecological development of Russia for the period up to 2030 has prioritized ensuring green economic growth and introducing environmental innovative technologies, preventing and reducing of negative ecological effect. Nowadays new technologies are the foundation of economic growth. New technologies are perspective and in-demand direction of modern science and industry in innovative and industrialized countries of the world. However, it is necessary to assess economic, social, legal consequences of new technologies and to develop approaches and methods for the solution of their introducing problems.

1. Introduction
Quality environmental assurance is one of the priorities of our State’s development. At present the reform of the pollution ration system and the establishment of pollution charges are happening. The major environmental quality assurance mechanism should be the one of the best available technologies (BAT).

The term «BAT» is established in the Directive of European Parliament and European Union Council as « the most efficient new developments for different kinds of activity, processes and methods of operations, which point to the practical usefulness of specific technologies as a foundation for imposition of pollutant emissions permit in order to prevent pollution and/or minimization of emissions to the environment in case prevention is practically impossible:

- «technologies» include both used technology and methods of design, creation, service exploitation and decommission;
- «available technologies» mean the technologies, developed on a scale sufficient to introduce them in corresponding industry through economic and technical feasible way while taking into account relevant costs and benefits. It makes no difference these technologies are used or produced within a member state or are not if they are reasonably convenient for the use by an economic operator;
- «the best» means allowing the most effective way to achieve the overall high level of environmental protection as a whole».
2. Materials and methods
The following legal categories are used in the article: available technologies, nanotechnologies, ecological problems, environmental security, State policy, environmental pollution, review of existing legislation. Used scientific concepts are not contrary to the system of principles, methods and ways of theoretical knowledge, underline the operationalization of an object in according to modern science, reflect important patterns of the establishment of modern research approaches (historical, institutional, integrated) and their features, show the structure of practical impact and the balance between theoretical and applied aspects of legal activity. The methods used in the research are adequate. Comparative legal, logical juridical and methods of analysis and synthesis are among them.

The used methods and approaches help to achieve the goals and the stated objectives that have been set.

3. Results and discussion
The different terms have been used in foreign legislation to denote the technologies promoting environmental protection, regeneration of the natural environment, environmental management as well as to provide for minimal possible expenditures of raw material and energy sources, minimal amounts of industrial and consumption waste: «best existing technology», «best environmental practice», «best available control technology», «best feasible treatment technology», «best traditional technology», «truly accessible control technology», «achieved low emission level», «best economically available attainable technology».[1]

For the first time the concept BAT was used in Russian legislation in the form of «best achieved production technology» as far back as 1978. [2]. This technology was not subject to regulate directly and applied as a basis for the establishment of provisionally agreed emissions to ensuring compliance of waste concentration to emission limit values. In the second half of 1990-ies the concept «best existing technology» was grounded in Russian legal framework by borrowing from European practice [3]. In the post-Soviet period the concept «best existing technology» was focused mainly on the list of the best existing technologies and, as the most favourable option, on the methods of allocation of such technologies which are accessible in the world market [4].

With the adoption of the Federal Law «On environmental security» [5] the concept «best existing technology» was introduced in Russian legislation, however, this introduction was purely formal and no real work was done in this and other directions. Legislative framework for transition to the use of BAT has been laid with this legislative act that provides legal conditions to implement a set of measures for ecological production modernization through the introduction of BAT in main branches. The term «BAT» is used in the law to designate the technology of production (products), works execution, service provision on the basis of modern scientific and technological achievements and the best combination of criteria for the achievement of environmental goals, subject to the availability of technical feasibility of its application. In current realities Russia is up for phasing out obsolete and ineffective technology and for shift towards adopting principles of BAT, thus it is necessary to create a completely new management system in the territory of the Russian Federation. It is possible only in implementing of integrated measures at the state level, the most of which are adopted and regulated at the RF Government level and relevant executive power bodies [6].

When introducing management system through BAT a single goal must be achieved: to raise competitiveness of domestic industrial production, to raise investment attractiveness and simultaneously reduce negative environmental impact. Consequently, the establishment of a State management system through the principles of BAT not only will affect environmental legislation but economic condition of industrial enterprises [7].

Criteria for BAT determination of technological processes and equipment are:

- the least negative environmental impact per unit of time or volume of production (products), works execution, service provision or compliance of other environmental impact indicators under the international treaties of The Russian Federation;
• economic effectiveness of introduction and exploitation;
• application of resource and energy efficient methods;
• the introduction period;
• industrial introduction of technological processes, equipment, techniques, methods which have negative environmental impact at two or more targets in the Russian Federation. Let us highlight basic principles of the environmental standard system through BAT (table 1). So, the application of BAT is focused on integrated prevention and (or) minimization of negative environmental impact and closely linked to the review of all ecological standards among which quality standards and permissible environmental impact standards [8].

Table 1. The principles of the environmental standard system through BAT.

| Principles                      | Characteristic                                                                 |
|---------------------------------|-------------------------------------------------------------------------------|
| Pollution prevention principle  | Since at present it is impossible to foresee clearly the results of environmental impact of economic activity it is necessary to reduce human interference level as much as it is technically achieved and cost-effective |
| The unity of production facility principle | Production facility is considered as a coherent whole in which each significant change in technology can influence environmental impact levels |
| Ecological security in production principle | Ecological security of production should be provided in all stages of the life cycle of the production facility including the stages of projecting, building, normal operations and accident circumstances, decommissioning |
| Sustainable development principle | The achievement of sustainable development goal necessitates the fullest possible and rational use of consumed natural resources and raw materials |

We believe based in this manner environmental management system allows not only raise the effectiveness of environmental protection but support profitability of industrial production in comparison with common fine increase for negative impact. Fighting environment degradation governments of different countries pay more attention to the «green» economy and strengthen their performance assessment system by adding environmental performance indices [9]. Using the mechanism of BAT with environmental impact rationing manages to reduce the amount of pollution without worsening financial indicators of Russian enterprises. Firstly, it will contribute positively to introduction of world ecological standards and resource-saving technology, as a result foreign countries’ experience in the area of environmental protection will be studied more deeply. Secondly, environmental standards are being renewed and the industrial damage to environmental objects calculation method has been approved by Rosstandard order [10]. Thirdly, the approach to the procedure for design, approval and change of environmental standards has been modernized. The present time is characterized by active law-making process aiming at the improvement of RF environmental rationing system. Severe audit of outdated and inadequate regulations has been done to deal with current reality; new standards of quality of environmental components have been established. All this shows that the environmental standard principle in Russian legislation is developing jointly with the methods of economic activity stimulus based on BAT. New technology is one of the most rapidly developing spheres of human activity. The most serious concern is the fact that alleged damage to human health and the environment is not still clear as no one world country has held global study on the subject. Along with advantages new nanomaterials often can be hazardous for the environment because of their chemical composition, hyper reactivity and very small size. The safety problems of nanomaterials production are not legally concretized, that, on one hand, allows to apply general norms of the law, which are for provision of safe conducting works, observance of
occupational safety regulations, patient protection; on the other hand, nanotechnology specificity is such that existing legal restrictions do not always allow to provide adequate security [11].

4. Conclusion
BAT is first of all innovative ideas and decisions which create environmentally safe method of producing and form the kind of production that can be defined as environmentally friendly. It is obvious that introduction of BAT enables environmentally sustainable development because being best they provide such structural and technological economic level that promotes rational resource consumption, minimization of technogenic impact on the environment. New technologies, in turn, can provide a basis of BAT development in certain industries. Therefore, various technologies for cleaning up of the environment should be proposed to prevent harmful effect on the environment in turn [12]. It is necessary to elaborate thoroughly the framework of safety provision and the ways of its legal implementation taking into account acquired and compiled study experience of harmful effects of nanomaterials production and application on the environment, human health and life. With comprehensible and clear framework of supporting BAT use investors will invest financial resources to the development of new technologies including nanoindustry.

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