

# A new generation of standards ISO 14001:2015 as the basis for green innovation and sustainable development: the case of Russian oil and gas companies



**N. V. Pakhomova,**  
*Doctor of Economics,*  
**Professor, Saint Petersburg State University**  
n.pahomova@spbu.ru



**A. V. Khoroshavin,**  
*assistant, PhD student,*  
**Saint Petersburg State University**  
a.horoshavin@spbu.ru



**G. B. Malyshkov,**  
*PhD in Economics, Associate Professor,*  
**Saint Petersburg Mining University**  
greg.malyshkov@gmail.com

*The Paris Agreement on climate change (2015) emphasizes among other priorities the importance of environmental innovation, including technical, technological, organizational, which have significant potential for minimizing the negative impact of the industry on the environment. The task of technological as well as organizational modernization is relevant to different sectors of the national economy. Especially it's important for Russian oil and gas companies. The authors analyze the new tools of environmental management, which are introduced in ISO 14001:2015 standard and elaborate some improvement recommendations for the oil and gas enterprises in context of Russian conditions. Besides, the authors analyze how to harmonize these requirements with the upcoming transition of oil and gas companies to the best available technologies, which are essentially the form of improving technical and technological innovation. To ensure the successful implementation of such innovation it is necessary to use, in addition to the environmental management standards, the mix of environmental policy instruments, including the so-called green finance.*

**Keywords:** green innovations, best available technology principle, sustainable development, risk management, environmental management system, ISO 14001:2015; alternative energy.

## Introduction

The Paris Agreement on climate change (2015) which was entered in force on 4 November 2016, gives the central attention to the structural modernization of economy through the gradual formation of a low-carbon growth model and the implementation of national GHG emissions reduction plans. In addition, this document emphasizes the importance of environmental innovation, including technical and technological, which have significant potential for minimizing the negative impact of industry on the environment. For example, article 10, paragraph 5, states that «accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change and promoting economic growth and sustainable development» [1].

Tasks of structural modernization and technological renovation of enterprises relevant to different sectors of the national economy. These problems have importance for Russian oil and gas companies. On the one hand, they should adapt directly to the radical restructuring of the

global fuel and energy balance, including the possible loss of revenue from traditional energy sources and to shift towards alternative and renewable energy sources. On the other hand, oil and gas companies are a group of companies, which, per the Federal Law № 219 and Decree of the Government of the Russian Federation of December 24, 2014 № 2674-p, should base their economic and (or) other activities for oil and natural gas extraction and processing on the best available technology (BAT) principle. To implement these legal requirements oil and gas companies will need to undertake not only a significant organizational effort, but they should spend for this purpose considerable financial resources. In these circumstances, it's important to consider fundamentally new tasks that face the system of strategic planning of their activities as well as the growing importance of an effective environmental management systems, which should ensure the organizational and motivational support for the forthcoming radical reforms.

In this context, the authors analyze the new requirements and tools of international standards

ISO 14001:2015 for environmental management systems (EMS) [2] from the perspective of corporate social responsibility goals with the emphasis on its ecological component. The authors observe the implementation of sustainable development principles and «green» innovations programs by Russian oil and gas companies, as well as associated problems, the overcoming of which must be considered by business and regulators during the transitional period of new ISO 14001 standards implementation in 2015-2018 years. Among such problems are the following: the lack of the development of the environmental infrastructure, the lack of the waste recycling infrastructure; the significant depreciation of fixed assets in the Russian industry, which will require a large-scale investment to comply with the BAT principle; the existence of some gaps in the national environmental legislation system and others.

The authors implement an integrated approach to the analysis of green innovation and sustainable development issues. Firstly, green innovation is understood as a process of development and commercialization of new solutions to environmental and related problems through technological, organizational, service and other improvements. Secondly, studying the conditions which are necessary for the implementation of environmental innovation, the authors realize a bilateral approach and consider both the demand and the supply side of innovation process. For the formation of the demand for environmental technical and technological innovation particular importance has the adoption of the above mentioned Federal Law № 219 «On Amendments to the Federal Law «On Environmental Protection...» (2014). This law creates the legal and, in some aspects, financial preconditions for the implementation of a package of measures for environmental modernization of production based on systematic implementation in key areas the best available technology. One again it is necessary to remind, that such technologies are in fact the form of improving technical and technological innovation. Regarding the production of environmental innovations (supply side of innovation process), this issue has its own importance. Special measures to solve this problem ought to be provided through the development of industrial policy and the strategy of import substitution.

To stimulate the green modernization Federal Law № 219 provides both positive and negative incentives. Regarding the preferential arrangements, they include compensation interest on the investment loan, accelerated depreciation of equipment corresponding to the criteria of BAT, the reduction of charges for impact on the environment after the implementation of BAT. The planned sanctions as the most important measures include an increase in ecological charges, comparable to the cost of cleaning emissions if the technological standards will not be met [3].

At the same time, in the accordance with integrated approach, updating the technical and technological basis of enterprises should be supported by organizational and management modernization. Russian oil and gas companies can resolve this part of the tasks with the help of the new or updated environmental management tools of the ISO 14001:2015 [4]. Although the solution of these

problems for the major Russian vertically integrated oil companies is facilitated by the fact that they have the systems of environmental management, ISO 14001:2004, the work for them should be estimated as rather considerable. The reason is that the new environmental management systems have several significant features with respect to the previous model. These include the following new features: the process approach to management, analysis of the context of the organization and the requirements of stakeholders, special attention to the risks management, lifecycle analysis and management, the development of the environmental performance and evaluation indicators, leadership management and some others. New tools of environmental management are intended to provide support for the implementation of the strategic objectives of the companies, their competitiveness and sustainable innovative development in a changing macro- and micro-environment of the organization and the tightening of the requirements of stakeholders [5].

As could be seen, the Russian oil and gas companies are facing at the same time with two serious challenges. On the one hand, based on the requirements of the Russian legislation companies of this sector should move to the principle of BAT through the implementation of large-scale measures to modernize their technology and equipment. With respect to the actual schedule, this task should be completed in 2020 [6]. On the other hand, they need to «rebuild» their own environmental management system to meet the requirements of a new generation of international standards.

Considering the above listed questions and problems the article contains the following findings:

- the authors analyses the new requirements for environmental management systems of ISO 14001:2015 that have a significant impact on the oil and gas companies;
- the article studies the first steps taken by foreign and Russian vertically integrated oil companies to improve their environmental management systems (EMS) to achieve the goals of sustainable development in the context of changing conditions and requirements;
- special attention is paid to the question of whether these standards are adequate to the task of forming the organizational conditions and incentives for the introduction of green innovation, including the adoption of the principle of BAT, or they should be supplemented by other instruments of environmental policy;
- finally, we provide the main conclusions on the necessary areas of improvement of the existing EMS of oil and gas enterprises as well as of other institutional arrangements which should support the upcoming large-scale changes.

## Discussions

In accordance with data for 2015, more than 320000 companies in 167 countries around the world have certified environmental management systems which are corresponded to the requirements of international standard ISO 14001:2004 [7]. This International Standard is one of the so-called second-generation standards. In

Russia, there are about 1300 such organizations (with a significant number in this list of the enterprises from energy, chemical and metallurgical sectors). In this respect, Russian oil and gas companies do not lag their foreign competitors. Now, almost all Russian companies of this sector have an environmental management system, certified in accordance with international standard ISO 14001:2004. The list of such companies includes Rosneft, Gazprom, Lukoil, Slavneft, Tatneft and Bashneft and many others companies

Summing up the results that have been achieved over the past 11 years, the representatives of the vertically integrated oil and gas companies make the following conclusions. The organization of environmental protection activities in accordance with international standards allowed them to provide the effective management and control of the companies in this field and to evaluate its activity in accordance with international best practices [8]. However, ISO 207 Technical Committee based on analysis of the practice of application of ISO 14001 version 2004 identified several opportunities of its improvement, including the needs to analyze the context of the organization, risk management, product lifecycle management and others [4, 9].

These new components are included in the new version of the international standard ISO 14001, which was published on 15 September 2015, in the form of the relevant requirements. During three-year transitional period, Russian companies should solve several fundamental problems in internal corporate governance restructuring, and in the sphere of interaction with the company's external stakeholders to prepare in advance to new requirements. These tasks are fully applicable to the enterprises of fuel-energy sectors, most of which are primarily large, vertically-integrated oil and gas companies, and they operate in global markets with heavy competition and increasing environmental risk.

To maintain a competitive and image benefits associated with a certified EMS, Russian oil and gas companies should undertake especially significant efforts. Among the circumstances that determined such a conclusion is the focus of the new standards on the strategic approach to environmental management. Such approach has for the oil and gas enterprises the fundamental importance due to the duration of the investment and production cycles and significant sunk cost. The same remark could be applied to the accounting risk parameters, which are associated with every direction of enterprise activity, including production, marketing, finance, environmental protection and others. Priority significance for these companies have the risks associated with global climate change and related changes in the structure of the world energy balance.

The risk side of the oil and gas companies' activity is becoming more significant due to redirection of the production and transportation of hydrocarbons processes to the regions with more complex natural and geological conditions (including shelf development projects). It's necessary to consider the increasing volatility of the global fuel and energy markets, as well as the lack of the effectiveness of several regulatory mechanisms, including within the framework of OPEC.

Along with the strategic and risk orientation, the new requirements of ISO 14001:2015 standards relate to the package of new tools of environmental management, including management of the life cycle of products/services, the introduction of environmental performance indicators, management leadership, etc. This «organizational innovation» is of fundamental importance for all vertically integrated oil companies in Russia, suggesting the restructuring of internal corporate governance, as well as mechanisms of interaction of the organization with the environment with a focus on strategic goals. In the light of these new requirements, the environmental management of the company, its tools and targets must be consistently integrated into the system of strategic management, including the components of this system, as the mission of the organization, its marketing, operational and financial strategy [5].

Among the organizational innovations of ISO 14001:2015 it is necessary to emphasize its focus on an integrated approach. We are talking about the harmonization of the new model of environmental management system with the requirements of other international standards, above all – with the requirements of ISO 9001. Not accidental the fact that the new versions of both standards have been published almost simultaneously. Moreover, per the ISO/IEC Directives, Part 1, the structure of the requirements of all management system standards (environmental, energy, safety, quality, etc.) has a common format and «basic» content [9]. Per this logic, the specialized subsystem of management at the enterprise should provide coordinated control based on the principles of sustainable development. This organizational innovation, among other things, could help to reduce the administrative barriers and transaction costs related to the certification procedures for compliance with various international management standards.

Special attention should be paid on restructuring mechanisms and instruments, which provide the interaction of the organization with its external environment, considering the associated risks. In the context of the risk analysis, adding to the marked previously on this issue, it is necessary to pay attention on changes in the structure of demand for Russian vertically integrated oil companies mainly in the European market of hydrocarbons concerning the parameters of quality and «green» innovations. We are talking about the risk of reducing the demand for «heavy» Russian Urals brand oil [10] in favor of the light crude oil of the Persian Gulf with a relatively low sulfur content, which is further exacerbated by the changing geopolitical situation. In the same series, there are the risks of alternative energy, more efficient and safe production technologies and others.

Investments in alternative energy have become a common practice for oil and gas companies worldwide. Traditional major players of the global energy market, as a rule, tend to occupy a leading position in new, alternative, energy sectors. For example, «Shell» company now actively invests in alternative energy. The same conclusion is valid for a leading German energy company «Eon» which have formed based on green projects a special business unit [11]. In this context, Saudi Aramco, the sector's largest company, demonstrate the remarkable

example of modernization its competitive strategy and the strategy of sustainable development. The company points out that in the current circumstances, there are the limited growth opportunities for the mining sector. Moreover, per some estimates of the company's management, the substantial size of the business may hinder the company to achieve successful financial results. To overcome these challenges Saudi Aramco is building a system of sustainable development through the creation of integrated energy and chemical value chain companies based on hydrocarbons with mandatory leadership in the development of alternative technologies and innovation to the future success of the company [12]. This strategy is fully in line with the integrated and long-term approach to environmental management, laid down in the new standard ISO 14001: 2015.

In Russia, a pioneer in this field was the largest private oil company Lukoil. The first step in this direction this company has undertaken a few years ago, when it has bought power of TGK-8, which is one to be privatized generating companies within Russian JSC «United Energy Branch» reform. The appearance of its own power plants has allowed Lukoil to build the industrial chain using its own natural gas produced in the north of the Caspian Sea. Today, Lukoil owns several thermal power plants of total capacity of 4.3 GW, located in the southern regions – in the Volgograd, Krasnodar and Stavropol Regions. Furthermore, this Company is an active participant of the energy generated in Russia [11].

Nevertheless, the overall situation in the segment of alternative or renewable energy (which integrates wind, solar, geothermal, wave, tidal, hydroelectric, biomass, landfill gas, gas from the plant wastewater treatment and biogas), cannot be assessed as satisfactory. Despite the efforts being made for the development of renewable energy sources (RES), and not only in developed but also in developing countries, Russian oil and gas vertically integrated companies are among the laggards in this innovation race [13].

Only «Lukoil» expressed interest in the sector of alternative energy however on its overseas branches. The Company has several projects in the alternative energy sector. On Lukoil refinery plant in the Bulgarian Burgas, along with traditional CHP (combined heat and power plant) operated were constructed and «green» objects, including photovoltaic solar plant with a capacity of 1,25 MW. Its electricity is now supplied to the national grid at a reduced rate in Bulgaria, approved for 20 years. In 2015, the actual production of the plant will be 1,470,000 kWh. Exemptions allow the company to develop new technological competence without the risk of loss. On the other Refinery in Romania was constructed solar power is 9 MW, located on the unused areas in the production of the oil-refinery plant «Petrotel» of Lukoil. In Romania, Lukoil and «ERG Renew» (leader in wind power equipment development) built and put into operation in south-eastern Romania wind farm «Land Power» of 42 wind turbines with total capacity of 84 MW. The company notes the synergistic effect of optimizing operating conditions inside the system with different types of energy production units. As explained in a recent interview with «Kommersant», Vagit Alekperov, Lukoil has given the

European experience to feel that this renewable energy. Now the company intends to apply it in Russia [11].

We can assume that the main activities of the Russian oil and gas sector VIC are affected by the market failures associated with some features of innovative processes. Here it's possible to suppose the following forms of market failure: the dependence of old-timer's companies operating in traditional markets on the advantages of traditional technology trajectory; the uncertainty of the results of investment in innovation, including environmental; behavioral barriers (as the part of consumer resistance to innovation).

Concerning the question of whether new environment management standards are adequate to the task of forming the organizational conditions and incentives for the introduction of green innovation, including the adoption of the principle of BAT, we can assume the following. Firstly, the main competitors of Russian oil and gas companies, especially from developed countries, solved the problem of the adoption of the BAT in the preceding period. Recall that, for example in the EU the principle of BAT started to be applied since the late 1990s. As for Russian companies, their transition to the principles of BAT, as mentioned earlier, is planned in 2020, namely after the planned date of entry into force of the new version of ISO 14001 (2018). Meanwhile, the usual recommendation for the implementation of environmental management systems in accordance with requirements of ISO 14001, is the following: implementation and certification of these systems should be preceded by technical and technological modernization of production. This fact should be considered by Russian oil and gas companies.

In addition, almost simultaneously address these two challenges could potentially have an adverse impact on the price competitiveness of Russian companies, and in any case, it requires a thorough economic assessment. Considering that the BAT is a kind of green innovation it can be encouraged to use in the implementation of relevant investment projects the instruments of green finance [14]. It is advisable to strengthen the support of the state to enterprises, which are at the same time adopting technological and organizational innovations, using a mix of environmental policy instruments.

Special attention should be paid on the conditions of implementation of the Russian oil and gas companies' targets to reduce greenhouse gas emissions in the light of the objectives of the Paris climate agreement. Obviously, the requirements for BAT for oil and gas companies must include the parameters characterizing the environmental impacts in the form of greenhouse gas emissions and energy efficiency. This will provide a synergistic effect, which can alleviate the above-discussed economic difficulties.

### Conclusions and additional remarks

In implementing the principle of BAT, it is reasonable to consider that essentially, in this case we are talking about the mass introduction of the improving technical and technological innovations that can meet serious barriers. Although the major difficulties to overcome these barriers fall on companies the state should also provide some support for these enterprises. The regulator should

consider special support measures in the form of green finance and other components of the mix of environmental policy instruments.

Analysis of the first steps of the Russian business in field of implementation of the new environmental management tools demonstrate their applicability in the Russian conditions for sustainable innovative development. It is necessary to consider the number of negative factors, including inadequate legislation and poor development of the environmental services market.

Based on the analysis of the ISO 14001:2015 new requirements and the experience of foreign and Russian VICs the following basic guidelines for oil and gas companies to align their EMS in compliance with the new requirements can be proposed. For these companies it is important:

- to develop and implement a systematic risk analysis of sustainable business development (risks to crude oil price volatility, the development of alternative energy, complex natural and geological conditions, etc.);
- to develop and implement the process of interaction with external stakeholders, including the elements of a comprehensive and systematic analysis of the needs and expectations of stakeholders to elaborate measures to increase loyalty from consumers, HR market, regional administrations and other stakeholders;
- to modify the management systems based on life cycle approach to improve the safety and efficiency of the products/services, including «green» innovations as the reduction of fuel according with Euro-5 standard, the safety analysis of the product to the EU system «REACH» etc. [9];
- to integrate of specialized management systems (environmental, quality, safety, energy efficiency) in the business processes of the organization, implying the involvement of top management and leadership in the development of VIC's integrated management system, which is designed to ensure the sustainable development of the company.

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## Новое поколение стандартов ИСО 14001:2015 как основа зеленых инноваций и устойчивого развития российских нефтегазовых компаний

**Н. В. Пахомова**, д. э. н., профессор, Санкт-Петербургский государственный университет.

**А. В. Хорошавин**, ассистент, аспирант, Санкт-Петербургский государственный университет.

**Г. Б. Малышков**, к. э. н., доцент, Санкт-Петербургский горный университет.

В Парижском соглашении по климату (2015), наряду с другими приоритетами, подчеркнута важность экологических инноваций, включая технико-технологические и организационные, которые обладают значительным потенциалом в области сокращения негативного воздействия индустрии на окружающую среду. Задача технологической и организационной модернизации, которая релевантна для различных секторов национальной экономики, имеет особое значение для российских нефтегазовых компаний. В этом контексте в статье анализируются новые инструменты экологического менеджмента, вводимые международным стандартом ИСО 14001:2015, и вырабатываются рекомендации для нефтегазовых компаний с учетом специфики российских условий. Наряду с этим, исследуется, как гармонизировать эти новые требования с предстоящим переходом компаний сектора на принцип наилучших доступных технологий, являющихся по сути разновидностью улучшающих технико-технологических инноваций. Подчеркивается, что для успешного внедрения этих инноваций необходимо дополнительно ориентироваться на применение «микса» инструментов экологической политики, включая зеленые финансы.

**Ключевые слова:** зеленые инновации; наилучшие доступные технологии; устойчивое развитие; риск-менеджмент; система экологического менеджмента; ИСО 14001:2015; альтернативная энергия.