



Resource Saving Innovative Forms of the Industrial Enterprises

**Alsu A. Lubnina^{1*}, Marina V. Shinkevich², Svetlana I. Ashmarina³, Natalia A. Zaitseva⁴,
Guzel B. Sayfutdinova⁵, Izida I. Ishmuradova⁶**

¹Kazan National Research Technological University, Kazan, Russia, ²Kazan National Research Technological University, Kazan, Russia, ³Samara State University of Economics, Samara, Russia, ⁴Plekhanov Russian University of Economics, Moscow, Russia, ⁵Kazan State Power Engineering University, Kazan, Russia, ⁶Kazan (Volga Region) Federal University, Kazan, Russia.

*Email: alsu1982@ya.ru

ABSTRACT

The relevance of the study is reasoned by the current economic trends which suggest that the reliability of production is possible to be provided, while preserving and enhancing of natural ecological environment, by finding of quality new, revolutionary opportunities associated with the use of resource-saving and energy-saving technologies and alternative reproducible sources of production activities, creation of favorable ecological, economic and social conditions for the accumulation and implementation of human capital. The purpose of this paper is to explore innovative forms of resource saving of the industrial enterprises, aimed at improving of the competitiveness of products, using innovative energy and resource saving technologies, minimizing the generation of waste. The leading method to the study of this problem is the modeling method that allows considering of this problem as a purposeful and organized process to improve the management of industrial enterprises. In paper gives the estimation of modern condition of mineral raw material base of hydrocarbons; scientifically substantiates recommendations on the appropriateness of innovative forms' choice of resource-saving at industrial enterprises. The practical value is in the fact that the results of the study allow better and more targeted adjusting of innovative activity of industrial enterprises through the application of innovative forms of resource saving and can be used in the framework of sector programs that are of interest for the state statistics bodies, ministries and agencies who are responsible for strategic analysis and planning.

Keywords: Resource Saving, Innovation, Competitiveness, Equity Sharing of Profits

JEL Classifications: O31, P28, Q32.

1. INTRODUCTION

1.1. The Relevance of the Study

Current world economic and geopolitical trends, increasing of competition in domestic and foreign markets demand immediate actions to optimize and improve the efficiency of the resource potential's use. Moreover, this directly concerns as single business entity so certain administrative-territorial formation in general. The necessity to introduce the resource-saving type of economic development is devoted numerous studies, publications in scientific and periodicals (Meshalkin et al., 2011; Shinkevich and Lubnina, 2011; Lazonick, 2006; Malysheva et al., 2016; Mensch, 1979). It is necessary consistently to develop methods and tools for resource-saving management of industrial enterprises, achieving adequate economic assessments of the real consumption of various resources' kinds (primarily tangible ones), as well as

capacity building of resource-saving production. Moreover, the need in acceleration of innovative development of society, through the creation and widespread application of waste-less and low-waste, resource-saving technologies, creation of environmentally safe production, the search for alternative sources of thermal and electric energy, etc., is declared as the main goals and objectives within the industrial, scientific-technical, energy, socio-economic and other policies of the Russian government.

2. METHODOLOGICAL FRAMEWORK

2.1. Theoretical Base of Research

The theoretical base of the paper is served by management theory, theory of innovation, neo-institutional theory, evolutionary theory of innovational changes, theory of the cyclical nature of innovation development, the theory of transaction costs, theory

of the effectiveness of economic phenomena and processes. The objectives of this research are: The study of innovative forms of resource saving of the industrial enterprises, aimed at improving of products' competitiveness, using innovative energy and resource saving technologies, minimizing the generation of waste.

2.2. Research Methods

For scientific results' obtaining general scientific and specific methods of knowledge were used: Formalization of the method, the dialectical method, method of analogies, analysis and synthesis, methods of systemic, structural-functional, economic-mathematical modeling, simulation, multivariate statistical analysis, comparison, index methods, matrix methods, forecasting methods.

2.3. The Stages of the Research

The study was conducted in three stages:

- At the first stage - The analysis of the state of hydrocarbons' mineral resources base.
- At the second stage - Innovative forms of the industrial enterprises' resources saving were proposed.
- At the third stage - Recommendations' set on the appropriateness of innovative forms' choice of resource-saving at industrial enterprises is scientifically substantiated.

3. RESULTS

3.1. The Modern State of Hydrocarbons Mineral Resource Base

At present, due to natural depletion and long-term exploitation of major oil fields there is a strong trend of deteriorating in resource base of oil industry of the Russian Federation. The share of active reserves, which provide 70% of the total oil production in the country, was fallen to 40%. The degree of their generation has increased to 75%. The share of scavenger stocks is 60%, their production degree remains low (30%).

Since 2006 in the Russian Federation the expanded reproduction of stocks is ensured. The status of the oil stocks' reproduction in the Russian Federation is shown in Table 1.

Moreover, there are about 1,600 oil fields are developing, and after a period of stabilization the oil production since 2000 began to rise again. In 2010 the volume of oil production exceeded 500 million tons, reaching 505 million tons (Table 2).

Reserve for further development in oil production in the country, replenishment of resource base of oil and gas is to increase the level of implementation of enhanced oil recovery (EOR) methods and involvement in the development of high-viscous oil, excess heavy oil and stocks in low permeable reservoirs.

The analysis shows that the oil recovery factor (ORF) in the Russian Federation has fallen steadily since 1965. Only in recent years there is a tendency to stabilize it. Reasons for the reduction of ORF are:

1. Inadequate selection of development technologies and methods to increase the oil recovery to real geological structure.
2. Imbalanced development systems due to the decommissioning of a huge (50% or more) of operating wells in certain oil companies.
3. The advanced development of the most productive strata in order to obtain maximum profit at the least cost.
4. A sharp reduction in the application of methods of EOR and the search for new effective technologies to increase ORF.
5. The absence of the fiscal stimulus measures in the development and implementation of modern tertiary EOR methods.

In modern conditions not the absolute growth of production but the economy of its production is becoming increasingly important, providing in-depth redistribution of hydrocarbons within the country at the enterprises of oil refining and petro-chemistry.

Thus, the mineral resource base of hydrocarbons of Russia, speaks about the need to develop methods and tools for resource-saving management of industrial enterprises, achieving of adequate economic assessments of the real resource consumption, as well as capacity building of resource-saving production.

3.2. Innovative Forms of Resource Saving of the Industrial Enterprises

In the early twenty-first century, the most important factor in the realization of transition to sustainable development is the creation and operation of high-performance resource-saving technologies, which ensure the production by high quality, environmentally safe products with optimal consumption of materials and energy, further improvement of existing technologies and rapid development of innovative resource-saving technologies.

Resource saving in industry or production is a purposeful combination of various research, educational, design-

Table 1: Status of oil stocks' reproduction in the Russian Federation for 1986-2014

Name of indicator	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011	2012	2013	2014
Increase in oil reserves, million tons	6890	2344	1245	1253	3434	700	680	635	530
Oil production, mln. tons	2760	1840	1538	2077	2460	5114	5180	5234	5267
Reproduction of mineral resource base, %	249	127	80	60	1396	1368	1313	1213	1006

Table 2: Levels of oil production in the Russian Federation for the period from 2008 to 2014

Oil production, million tons per year	2008	2009	2010	2011	2012	2013	2014
Factual ES-2030	4881	4942	5052	5110	5180	5234	5267
	4880	4940	4940	4940	4950	4950	4950
General scheme of the Russian Federation:	4880	4940	4960	4840	4730	462	454
planning version project version	4880	4940	4960	5050	5130	522	531

engineering, production-economic, production and economic, managerial and trading activities, performed on the basis of full use of intellectual and informational resources of society to ensure optimal unit cost of all types of natural, human and material resources, necessary for the production in the required time of the required type of the required quantity and quality of products (goods or services) keeping to the conditions of national and international legislation and conditions of environmental protection from pollution.

The most important directions of resource-saving logistics are the development and application of:

1. Methods of synthesis of economically optimal resource-saving industries.
2. Methods of optimal planning and management of inventory.
3. Methods of optimal planning and management of needs in materials, raw materials and fuel-energy resources in the production process.

One of the most important innovative activities of the enterprises - Suppliers is the use of innovative supply strategies, which is called "supply chain management based on the strategy of equity profit sharing, or equity savings," i.e. the allocation strategy of savings, or shared of savings between the provider - enterprise and the customer - enterprise.

The essence of corporate strategy of supply chains' management is as follows: The products' suppliers are provided with direct equity participation in profit from increased efficiency in the use of products in the company-the consumer. This corporate strategy provides key benefits for enterprise's management, which is a consumer of products, including reduced operating costs and increased productivity, as well as significantly improves the environmental performance of the enterprise - customer.

In practice, it is possible to allocate a large number of relationships in supply chains. These relations can be grouped into a hierarchy, which consists of four levels:

- Equity sharing of profits
- Limited management
- Service
- Traditional relationships on the supply.

Traditional relationships on products' supply are characterized by almost complete concentration on the process of transaction, i.e., the exchange of products for money. The consumer first needs to find a supplier with the lowest price and should use any type of competitive effect for maintaining of low prices. The producer's profit is determined by the volume of sales that is causing the conflict of interest between the consumer and the supplier.

The supplier must deliver the products "just in time" and with a certain level of quality. Products' parameters often are limited for these three areas. Since the success of the supplier is determined through short-term indicators (price, quality, delivery), the threat of suppliers' changing is often used as an impact to solve problems related to indicators. This in turn requires a long-term investment.

Relations on the deals on the supplies are most commonly used for a small number of basic products. The provider provides only one or several types of products. For certain products consumers can even have many different suppliers. However, many companies bring together suppliers, without changing of traditional relations on the supply. These suppliers can provide many kinds of products, but the price, quantity and delivery continue to occupy a primary place in the relationship.

Relationship of service offers increased consumer cost of the products compared with the strategy of the transactions. The products are still purchased on the basis of volume, but related services of products' management are more important component of the relations on the supply.

The service can cover the entire range of options, but mainly is focused on logistics services, especially outside of the enterprise - Such as improved product packaging, delivery "just in time", orders on the basis of electronic data exchange, etc.

Between the relationship on maintenance and management there are no clear boundaries. The main difference is in problems' solving. In products' management software suppliers are ranked higher for their in-depth knowledge about products and product management. Thus, the involvement of supplier in joint problems' solving is a Central component of the relationship. The supplier participates in situations' developing by providing of knowledge about the products as well as expertise and management experience. This is different from the relationship on maintenance and relationship on transactions in which the supplier is primarily responsible for the requirements of the buyer.

In programs of products' limited management the structure of payment is a payment in the form of method of calculation "dollars per pound plus service," as well as management fee. Provider's services tend to have heavy weight of logistical activities and actions to ensure compliance with regulatory-legislative acts on natural environment protection, health and life activities' safety, although in some cases, the full range of services can be provided. Services are often provided as at the enterprise - Buyer's place and beyond. Basically, the provider appoints one or more permanent employees in the enterprise. In some cases, these limited relationships may actually be quite extensive.

When the payment of the provider is formed to align the interests of the products' supplier and customer, then the relationship on management of these products becomes relationship on products' management based on an equity profit sharing.

In the program of equity profit sharing one or more of the following structures are used: Payment: The product's item's price, fixed fee and unit price. Unity of financial interests of the buyer and the supplier in order to reduce production volume and increase of value, or price for consumers largely improves collaboration, continuous improvement and innovations' implementation.

Share profit sharing creates risks for both sides, but there are ample opportunities to increase financial returns than during traditional

relationships. Such programs usually include competitive services of the provider, active problems' solving, a long list of basic products and a more intensive measurement of the efficiency parameters.

The payment system is a method used to reward the products' provider. There are the following payment systems:

1. "Dollar for pound"- This is typical approach when products are sold by weight, it gives rise to business relations in supply chains, in which the dominant factor is the price of this product. Due to the increase of supply the supplier gets more profit.
2. "Dollar per pound plus services" - The consumer can pay a higher price, but he expects from the supplier of additional services' rendering. The supplier gets more profit by providing better services and increased supply.
3. "Payments for management" is a service of the provider allocated from the cost of production, to prevent the desire of a supplier to constant increase of the volume of products' supply. The costs are given to the consumer, and the products can be purchased from third-party suppliers.
4. "Equity division of profits or share economy" - products' consumers no longer purchases products; instead of it, the provider is paid a fixed rate per month or for unit of products' output. The profit of the supplier is no longer associated with the volume of supply of products. Reducing the volumes of products required by the customer, the supplier reduces its costs and receives a large profit. Essentially, the consumption's reduction turns into savings to be distributed between the consumer and the products' provider.

At each hierarchy level of payment systems the compensation paid to a provider, increasingly is determined by the usefulness of its services to the consumer and not by the volume of goods delivered.

3.3. Recommendations on the Appropriateness of Innovative Forms' Choice of Resource Saving in the Industrial Enterprises

Based on the strategy of the equity profit sharing the main characteristics of relationships in supply chain management can be identified:

1. The consumer doesn't buy just a product, it is the property of the supplier until it is used in the production process at the enterprise-the consumer.
2. The provider receives a fixed payment (per month or unit of production) in exchange for characteristics' granting (quality indicators) of products.
3. The supplier gets the profit by reducing the amount of the products' use and their costs, but not at the expense of sales.
4. The provider provides the products' management at the place of its use, including compliance with the requirements of labor protection, advanced logistics services and application services on products' using.

It should be noted that at the strategy of the equity profit sharing, the consumer no longer buys the products. Provider is paid fees for enterprises' needs satisfaction in products. The lack of correlation between provider's revenue and volume of production gives a

significant effect. Provider's income is constant regardless of products' output, whereas its costs vary in direct proportion to the amount of consumed products. This creates an incentive for the supplier to reduce consumption of products with the aim of profits' increasing. Decrease in products' consumption is achieved by improving of the efficiency of products' operation. This creates an incentive for the supplier associated with the interests of products' consumer, to reduce their volume. It is opposite to traditional relationships in products' supply where financial incentives of the provider depend on growth in product sales.

It can be concluded that products' management programs on the basis of the strategy of equity profit sharing provide valuable benefits, both to consumers and suppliers. The consumer gets the benefit from costs' reducing and efficiency's improving in the use of products. Costs' reduction affects all costs on activities associated with the use of this product, including inventory, logistics, cargo handling, waste disposal, etc. The nomenclature and volumes of the used products is reduced. The efficiency characteristics are increased not only of basic services, but also of basic production processes.

4. DISCUSSIONS

The necessity to implement resource-saving type of economic development is the subject of numerous studies, publications in scientific journals and periodicals (Meshalkin et al., 2011; Shinkevich and Lubnina, 2011; Lazonick, 2006; Malysheva et al., 2016; Mensch, 1979). Considerable scientific interest belongs to the development of methodological approaches to evaluating of the effectiveness and management of institutionalization of sustainable innovative development. Fragmental studies or tasks' formulation by economists are known, which can be adapted to solve this scientific problem. They include the findings and results of some researches (Polterovich and Popov, 2007; Tatarkin and Romanova, 2008; Katkalo, 2003) Relatively is small the number of publications which are devoted to the study of forms of cooperation of enterprises in supply chains, based on the strategy of equity profit sharing (Brandenburger and Nalebuff, 1996; Moore, 1996; Shinkevich, 2005; Shinkevich et al., 2013; 2015; Zaraychenko et al., 2016; Galimulina et al., 2016; Kudryavtseva et al., 2016).

However, there is a vast methodological and theoretical data and practical solutions and still there is no a single methodology of innovative development of enterprises based on resource-saving and formalized quantitative approaches that combine the latest achievements of modern management science and taking into account substantial specifics.

5. CONCLUSION

In the paper estimation of modern condition of hydrocarbons' mineral raw material base is given; the main problems and reasons for the decrease of the coefficient of oil recovery in the Russian Federation are revealed. The basic forms of resource saving in industry and production are identified.

Recommendations' set is scientifically substantiated on the choices' appropriateness of innovative forms of resource saving in the industrial enterprises, based on the strategy of the equity profit sharing, the essence of which is as follows: The products' suppliers are provided with direct equity participation in profit from increased efficiency in the use of products in the enterprise - consumer. The proposed strategy allows reducing of activities' costs associated with the use of this product, including inventory, logistics, cargo handling, waste disposal, etc.

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