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## **Management of resource saving as a factor in transition to an efficient economy**

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### **Abstract**

The article examines the macroeconomic indicators of the Russian mining industry, their dynamics and growth trends. The author of the article has analyzed the efficiency of the use of resources and produced recommendations aimed at improving the efficiency of the fulfilment of Russia's resource potential. The author points out that the implementation of the resource conservation policy is not only a strategic objective of a single enterprise trying to survive and withstand the existing market conditions and striving for improving its competitiveness in the industrial market, but also the tactical objective of increasing the economic potential of the national economy. Industrial policy in the sphere of resource conservation should be developed at all levels of the economic system of the national economy. The main ways of the implementation of programs for resource conservation and forms of state control are determined at the macro-level. Forms and methods facilitating their implementation in the region are determined at the meso-level, territorial and regional characteristics being taken into account. Rules and regulations, as well as mechanisms for their use are developed at the micro-level, the specifics of each business entity being taken into account.

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**Keywords**

Resource conservation, resource base, energy resources, costs, competitiveness, resource intensity, macroeconomic indicators.

## Introduction

Russia is the fourth largest producer of energy in the world (after the OPEC, China and the United States) and the sixth largest consumer (after China, the US, the EU, the OPEC and India) among the key players in the energy markets, providing 10% of the world production and 5% of the world energy consumption. Russia consistently ranks first in the world among the gas exporters, second among the oil exporters (by the year 2040 it will become the third after Saudi Arabia and Iraq), and third after Australia and Indonesia among the coal exporters. With the amount of energy production around 1,470 million TOE, Russia exports 630 million TOE, which is 16% of the global inter-regional energy trade and which makes Russia the absolute world leader in the export of energy resources [Arkhipov et al., 2014, 111, www].

### **The resource potential of the national economy of the Russian Federation**

The greater part of energy resources is concentrated in the eastern regions of the country, where the largest deposits are located. The major deposits of resources are in the West Siberian, Volga-Urals, Timan-Pechora petroliferous regions, as well as in the North Caucasus and the Far East.

Most of the deposits in Russia are hard-to-recover; besides, continuous growth of the number of such deposits is observed (they account for more than 60% of do-

mestic resources [Primenenie sovremennykh metodov..., www]). High depletion of the operating oil fields has dramatically lowered the industry average oil recovery factor: while in the mid-1980s Russia's average oil recovery factor (ORF) was more than 40%, by 2010 it was down to 30%<sup>1</sup>.

Thanks to new technologies, the production output from the producing fields is increasing (Table 1), and the marginal wells is being developed, which have long been "frozen" because of their low economic efficiency.

**Table 1. Oil extraction from the formations, developed using the artificial stimulation methods<sup>2</sup>**

	2012	2013	The change in 2013 relative to the year of 2012 (+/-),
	(tons)		%
<b>Russian Federation</b>	<b>429087144</b>	<b>437415492</b>	<b>1.94</b>
<i>Extraction by water injection methods</i>	368367401	379405602	3.00
including:			
hydrodynamic methods	72426599	79519058	9.79
<i>Extraction by new methods</i>	60719743	58009890	-4.46
including:			
physico-chemical (including gas methods)	57697315	58009890	0.54
thermal	3022428	3073351	1.68

Analysts predict a production drop after the year of 2025. In this case, the increase of production can be realized using the methods of enhanced oil recovery (EOR) and the introduction of domestic technologies of extracting the shale oil on the deposits of the Bazhenov Formation.

The application of EOR will significantly increase the resource base of the petroleum industry due to increasing oil recovery (oil recovery factor). So, if the oil recovery factor is supposed to be increased in comparison to the level of 2010 by 10%, then with the large-scale implementation of EOR in the existing Russian oilfields the oil recovery factor may increase by another 10%, yielding the production growth of almost 20 million tons already by the year of 2035.

1 According to the data of the RF Ministry of Energy.

2 The data do not include small businesses. The source: Federal State Statistics Service [Federal'naya sluzhba gosudarstvennoi statistiki, www].

Considering the application of EOR, we need to indicate that the methods of increasing oil recovery will greatly push up production costs. According to the estimates of the Ernst & Young company (see: [Primenenie sovremennykh metodov..., www]), the current unit cost (excluding tax) at the Russian deposits in the case of EOR application may increase from the current \$15 2010/barr. to \$50 2010/barr. [Nikishchenko, 2013, www]; and a tax reduction will be necessary in order that the projects using EOR become attractive to companies under the forecasted oil prices [Arkhipov et al., 2014, 134, www].

This all may create a situation that after 2020 the domestic oil exporters will begin to concede the market niche to the Middle East suppliers with cheaper resource.

Regarding the production and sale of natural gas, analysts predict that on the European market Russia will be able to even slightly strengthen its position in the short term. For example, in 2015, due to gas shortages, Russian supplies will provide the maximum share of import and consumption in Europe; however, after that there will begin a long decline of this share, and only after 2035, with the arrival of a next wave of supply shortages, Russia will begin to recover its positions [Arkhipov et al., 2014, 113, www].

Thus, considering all the forecasted scenarios of the development of the domestic production of raw materials, their demand in the global market, an issue is becoming topical like never before of their rational using and focusing the attention on the strategy in the production cost management, which will contribute to the technical and technological development of both enterprises and the macroeconomic complex as a whole. Only the rational use of resources is a powerful reserve in the increasing the efficiency of public production, ensuring stable growth of its competitiveness and the conformance to the requirements of the market.

Table 2 presents the dynamics of the effectiveness indicators of the resource usage at the macro-level using an example of extractive industry. According to the table data, we see an increase of efficiency before the year 2011, while in subsequent years, a tendency is observed of keeping a constant level of some of the costs (the cost of thermal power) or their small increase compared to the growth in labor costs and the renewal costs of the fixed assets of the enterprise.

In addition, we have calculated the resource productivity coefficient, which demonstrates the effectiveness of the use of resources in the industry.

Resource productivity coefficient = (Sales proceeds) / (Sum of all costs – Amortization charges)

So, we can see from the presented data that in 2011, to every rouble of costs there corresponded 0.81 roubles of sales proceeds, which indicates a positive trend of returns of the resources used.

**Table 2. Macroeconomic indicators of efficient use of resources in Russia (mining)<sup>3</sup>**

	Indicators	Unit of measurement	2009	2010	2011	2012	2013	Growth rate of 2010 relative to 2009 (in %)	Growth rate of 2011 relative to 2010 (in %)	Growth rate of 2012 relative to 2011 (in %)	Growth rate of 2013 relative to 2012 (in %)
1.	Annual average number	Thousands of persons	1067	1057	1063	1080,00	1075,00	-0.94	0.57	1.60	-0.46
2.	Average monthly nominal wages	Millions of roubles	35.3634	39.895	45.132	50.40	54.16	12.81	13.13	11.67	7.46
3.	Fixed funds	Millions of roubles	7861116	9084573	10574297	12242237.00	14106953.00	15.56	16.40	15.77	15.23
4.	Amortization	Mill. of roubles	490114	557308	672361	766256.00	871075.00	13.71	20.64	13.96	13.68
5.	Labor costs	Mill. of roubles	37732.75	42169.02	47975.32	54432.65	58223.29	11.76	13.77	13.46	6.96
6.	Electric energy costs	Mill. of roubles	2.01	2.02	2.12	3.17	5.96	0.50	5.17	49.09	88.05
7.	Thermal energy costs	Mill. of roubles	178.00	178.00	178.00	178.00	178.00	0.00	0.00	0.00	0.00
8.	Fuel costs	Mill. of roubles	47.96	51.59	55.46	57.93	53.97	7.57	7.49	4.46	-6.84
9.	Investments	Mill. of roubles	3335.40	3792.00	4602.90	5575.2	5992.2	13.69	21.38	21.12	7.48
10.	<b>Production volume</b>	Mill. of roubles	<b>5090973</b>	<b>6217952</b>	<b>8020217</b>	<b>8950066.00</b>	<b>9748137.00</b>	<b>22.14</b>	<b>28.98</b>	<b>11.59</b>	<b>8.92</b>
11.	<b>Resource productivity coefficient</b>		<b>0.69</b>	<b>0.73</b>	<b>0.81</b>	<b>0.78</b>	<b>0.73</b>	<b>5.60</b>	<b>11.09</b>	<b>-3.70</b>	<b>-5.53</b>

3 Compiled by the author on the basis of the data of the Federal State Statistics Service [Federal'naya sluzhba gosudarstvennoi statistiki, www].

The year of 2011 can be considered as the most effective year in terms of using resources; in this year there is observed some growth of the major indicators and the reduction of the share of costs in the production cost of the extraction industry.

Of course, the high level of resource consumption, especially of energy, labor consumption and the waste volume of the domestic industrial production leads to some negative consequences, which primarily include:

- an increase in the cost of production and reduction of its competitiveness both on the external and internal markets;
- an increase in the level of substituting domestic goods by the imported ones, which leads to a reduction in many kinds of manufacturing in our country;
- preservation and even growth of the economy needs in the additional raw materials and energy resources as a result of low efficiency of their use;
- deformation of the sectoral structure of industry in the direction of closing-down the knowledge-intensive kinds of production and an increase in the share of extractive industries;
- deterioration of the economic situation as a result of the pollution growth;
- an increase in the rate of inflation due to the rise in prices, especially ones for energy and other raw materials [Bayanduryan, Lushnikov, 2011, 3, www].

Thus, in order that the indicated problems do not lead to economic damage, it is necessary to develop programs at the macroeconomic level concerning sustainable use of the resource base of the country.

Besides, it is necessary to take into account the fact that mining industry plays a very important role in the development of the national economy. The contribution of this complex, consisted of 16 sectors, into the country's GDP creation is more than 7% (Table 3), and in recent years there is observed a tendency of its reducing.

**Table 3. Share of mining industry in GDP<sup>4</sup>**

Year	GDP, billions of roubles	Gross value added of mining industry, billions of roubles	Share, %
2009	38048.6	3207.1	8.43
2010	39762.2	3419.8	8.60
2011	41457.8	3535.9	8.53

4 Compiled on the basis of the data of Federal State Statistics Service [Federal State Statistics Service, www].

**Table 3. (Continuation)**

Year	GDP, billions of roubles	Gross value added of mining industry, billions of roubles	Share, %
2012	42872.9	3593.8	8.38
2013	43411.3	3456.5	7.96
2014	43656.2	3460.1	7.93

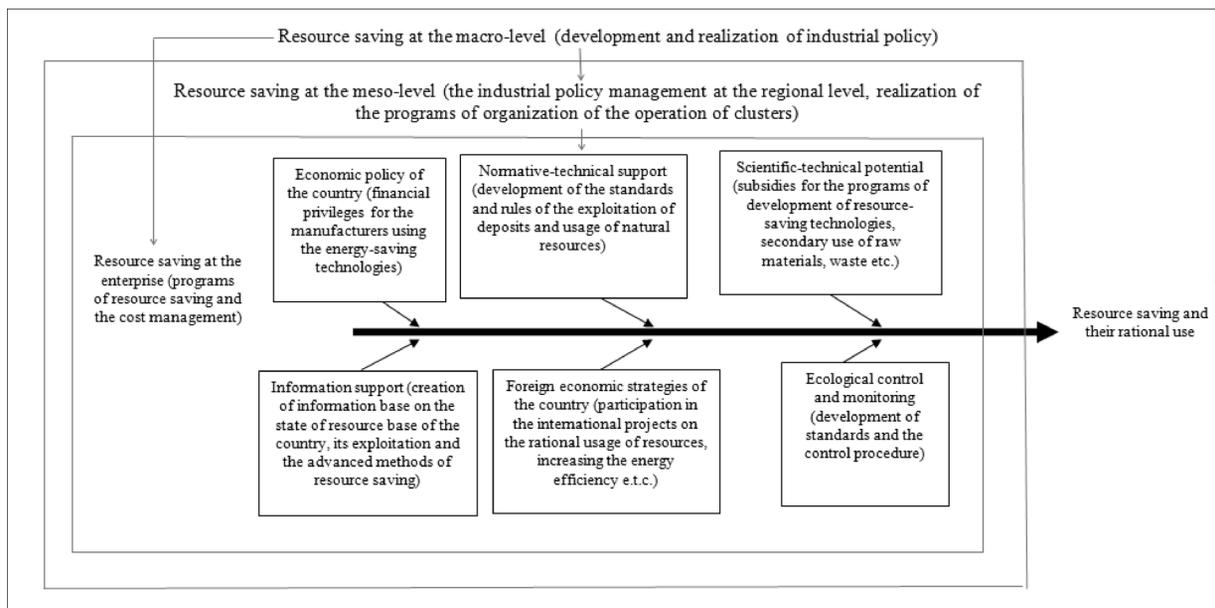
On one hand, this is a positive trend, informing that the understanding is gradually formed that the budget of the national economy should be formed not only by the extractive industries, and it is necessary to rely on the manufacturing industry.

On the other hand, such a state of affairs may indicate that a crisis situation is developing in this sector of economy. External factors of the market environment, with its swings in the price range and rigid forms of control of the legislative and tax system, depletion of the resource base do not make it possible to increase production.

Therefore, in order to survive in such difficult economic and political conditions, the programs of "focusing on the costs of production", the rational use of the resource base should be made a priority.

To implement this task, it is necessary to identify the factors that will directly influence the execution of these programs.

Figure 1 demonstrates the macroeconomic factors of efficient use of resources, the inclined arrows of the upper parameters show the direct influence on the resource



**Figure 1. Macro-economic factors of resource saving**

saving management at the micro level; the impact of the lower factors is indirect, but they should also be considered, since they affect the operation of the entire system.

## Conclusion

Thus, we see that the implementation of resource-saving policy is not only a strategic task of an individual enterprise, which tries to survive and resist the forming market conditions, strives to manage its competitiveness in the industry market, but also a tactical task of building up the economic potential of the national economy<sup>5</sup>.

The industrial policy in the field of resource saving should be developed at all levels of the national economic system within its mandate and capabilities for its implementation and monitoring.

At the macro-level there are identified the basic ways of implementation of the resource-saving programs and forms of the state control. At the meso-level there are determined the forms and methods, facilitating their realization in the region, taking into account the territorial and regional specificities. At the micro-level there are developed the norms and normative standards, as well as the mechanisms of their usage in view of specificities of each individual economic entity.

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5 It is worth noting that the implementation of this policy is especially important at the present stage of economic development, among the specific features of which are the closely interwoven processes of globalization and regionalization, the growth of risk-taking in the socio-economic development, the ongoing influence on the Russian economy of the geopolitical crisis and the Western economic sanctions, the fall of the world oil prices and the fluctuations of the national currency rate [Afonsova, 2015, 48].

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## **Управление ресурсосбережением как фактор перехода к эффективной экономике**

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### **Аннотация**

В работе рассматриваются макроэкономические показатели добывающей промышленности России, их динамика и тенденции роста. По представленным данным сделан анализ эффективности использования ресурсов в анализируемом комплексе. Даны рекомендации для повышения эффективности использования ресурсного потенциала России.

### **Для цитирования в научных исследованиях**

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### **Ключевые слова**

Ресурсосбережение, ресурсная база, энергоресурсы, издержки, конкурентоспособность, ресурсоемкость, макроэкономические показатели.

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