

Effect of License Holder's Cost-Flow on Long-Term Development of Oil Industry

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Abstract

The paper considers issues of the effect of the license holder's costs-flow on the possibility of increased investments in the operating process at the expense of mineral resources tax variation. The account flow of subsoil users is the sum of expenses of operating (current) and investment activities. The movement of a cash flow as a difference between profitable and account parts, for the enterprises of oil production characterizes financial stability and profitability of the company. As showed the carried-out analysis if to consider an account stream of operating activities of the oil-extracting enterprises, it appears that it by 5,6 times exceeds expenses of an investment stream.

Keywords: mineral resources production tax, oil production, enhanced recovery methods, product cost, cost-flow, economic benefits.

1. Introduction

The paper discusses the main options for perspective development of oil production in the oil facility at the expense of license holder's cost-flow, based on model calculations of changes in the mineral production tax (MPT) rate as the main item of expenditures.

The data obtained can be used for further analysis and deeper understanding of license holder's cost-flow, as the sum of operating (current) and investment costs.

According to the results of the study the following conclusions were made:

- MRT has the largest share in the license holder's cost-flow;
- the use of reduction factors to the MPT rate significantly increases the investment potential of oil companies;
- additional funds by reducing the cost-flow should be directed to the future development of production with an increase in the final oil recovery factor;
- integrated use of additional funds through the drilling of new wells and application of modern technologies and enhanced oil recovery (EOR) methods provides the most benefits
- when assessing the amount of additional resources from the reduced MRT rate it is necessary to consider the emerging benefit from the additional oil production as a source of the multiplier effect;
- an additional source of funding for long-term development of oil production by reducing the license's holders cost-flow will allow at least to stabilize oil production by field over a short period.

2. Method

Most recently adopted legislation to some extent reduces the tax burden on the final figures of the license's holder and establishes the financial basis for the perspective development of industrial production [1-5].

Consider the effect of reducing the MPT (decrease of cost-flow) on the stable oil production by means of model calculations.

Increase in oil production (δq) after the first year of using the reduction factors to the MPT rate in order to engage additional reserves in the development, and enhance the competitiveness of enterprises is shown in Fig. 1.

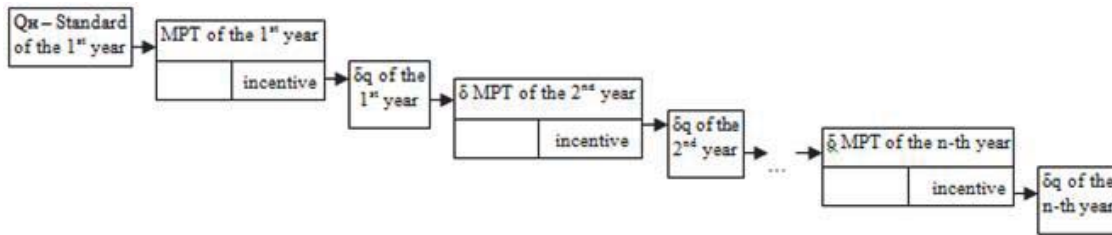


Fig. 1. Flowchart of oil production increase by reducing cost-flow of the first target year

Reduction in MPT rate, given the investing of the released funds into the development of industrial sites, provides increase in oil production not only as a result of initial investment, but also for the future due to the multiplier effect.

Then the annual growth of oil production from the MPT relief can be described by a square matrix of the triangular form:

	t_1	t_2	t_3	...	t_{n-1}	t_n
ΔQ_1	δq_{1_1}	δq_{1_2}	δq_{1_3}	...	$\delta q_{1_{n-1}}$	δq_{1_n}
ΔQ_2	0	δq_{2_2}	δq_{2_3}	...	$\delta q_{2_{n-1}}$	δq_{2_n}
ΔQ_3	0	0	δq_{3_3}	...	$\delta q_{3_{n-1}}$	δq_{3_n}
⋮	⋮	⋮	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮	⋮	⋮
ΔQ_{n-1}	0	0	0	...	$\delta q_{n-1_{n-1}}$	δq_{n-1_n}
ΔQ_n	0	0	0	...	0	δq_{n_n}

Additional oil production (Q) due to non-recurring costs of MPT differentiation (q) of any year t will be described by the formula

$$\Delta Q_t = \sum_{i=1}^t \delta q_{i_t}, \text{ for } t = t_1 \dots t_n.$$

Model calculations of the use of funds from the MPT differentiation for the increase in the oil recovery factor (ORF) by drilling additional wells (densening of well patterns) for one of the oil fields of Tatarstan are shown in Fig. 2.

3. Result

Using the base-case scenario, the prospective oil production has been declining by 10% annually and by the end of the target period (25 years) was 26.3 thousand tons (17.5% of the original annual oil production).

Reduction of MPT by 25% according to the base-case scenario will allow to increase the additional volume of oil production by 987 thous. tons. According to this scenario, oil production is expected to reach 63.7 thous. tons in the final target year, which is 2.4 times more than in the basic scenario. In addition 55 new wells are introduced to the development.

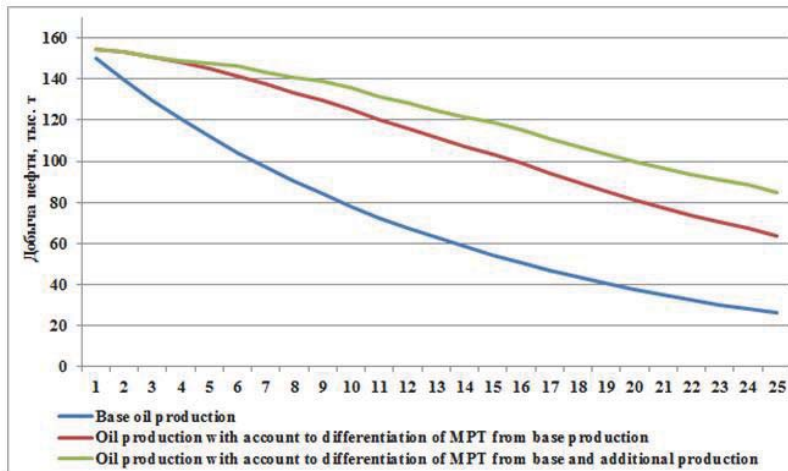


Fig. 2. Dynamics of oil production from the reduction of cost-flow by drilling new wells

Introduction of additional wells increases the additional oil production and, therefore, provides an additional amount of funding by reducing cost-flow, which allows to drill 22 new wells and provide a more gradual decline in oil production by the years of the target period. According to this scenario, in the final target year, oil production is expected to reach 85 thous. tons.

Increase of the final oil recovery factor (ORF) and the combination of new drilling and large-scale application of EOR due to additional oil production from reduced cost-flow is shown in Fig. 3.

The use of tax incentives according to the base-case scenario will allow to produce further 989 thous. tons. According to this scenario, in the final target year, oil production is expected to reach 61.8 thous. tons, in addition 41 new wells are introduced to the development, the scope of EOR application will be 475 well operations. This will allow to increase oil production by 4 thous. tons in the first years of the target period.

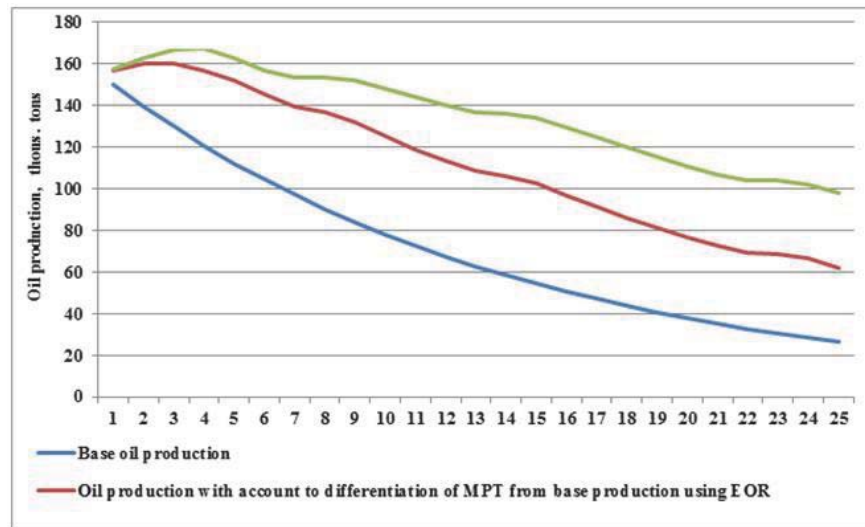


Fig. 3. Dynamics of oil production to reduce the cost-flow by drilling new wells and EOR

Additional oil production provides an increase in the amount of funding by stimulating MPT. It will enable to drill 22 new wells and carry 645 well operations using EOR technologies, which ensure a higher level of annual oil production by the years of the target period. According to this scenario, in the final target year, oil production is expected to reach 97.7 thous. tons, that is 3.7 times more than in the base-case scenario development. In the target period it is planned to produce further 1.6 million tons of oil, and the state budget will receive additional 2.2 billion rubles only from MRT.

4. Conclusion

- Cost-flow of oil companies include operating (current) and investment costs;
- the largest share in the cost-flow of oil companies belongs to MPT, which is 54% overall of the cost-flow;
- the use of reduction factors to the MPT rate significantly increases the investment potential of oil companies by reducing cost-flow;
- additional money released by reducing cost-flow should be directed to the future development of production with obligatory increase in ORF;
- integrated use of additional funds through the drilling of new wells and application of modern EOR technologies provides the most benefits;
- when assessing the amount of additional resources by reducing the cost-flow one must consider the emerging benefit from additional oil production by an annual incentive which provides a multiplier effect;
- additional source of funds for long-term development of oil production by reducing the license's holders cost-flow will at least allow to stabilize oil production at the enterprise in the short term.

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