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RESTRICTIONS ON USING GTL-TECHNOLOGIES IN THE GAS PROCESSING INDUSTRY

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Russia owns the largest resources of nature gas, produces 20% of total amount of gas in the world, being the largest exporter. On European market the share of Russian pipeline gas exceeds 25%, and Russia owns 6% of the world market of compressed natural gas.

At the same time in Russia up to 25% of produced Associated Petroleum Gas (APG) is being burned in flambeau lights and another 10-12% is being written off to technical loss. Due to such indexes our country ranks second after Nigeria among the largest centers of APG firing. Even according to official data in natural units not less than 20 billion m^2 is fired, that is equal to 500 billion RUR lost annually.

By the way real loss – 140 billion RUR and 360 billion RUR forms lost profit. It is formed due to the ecological damage inflicted on the basins (oil and gas provinces), absence of valued added that could be produced by manufacturing sectors if the gas refining sector was advanced and as consequence the loss in growth rate of GDP.

As far as 95% APG should be utilize in the country by 2011 year, and only large oil and gas companies own the access to the existing gas-processing plants, achieving of such high index of utilization is possible by the way of small gas refining development.

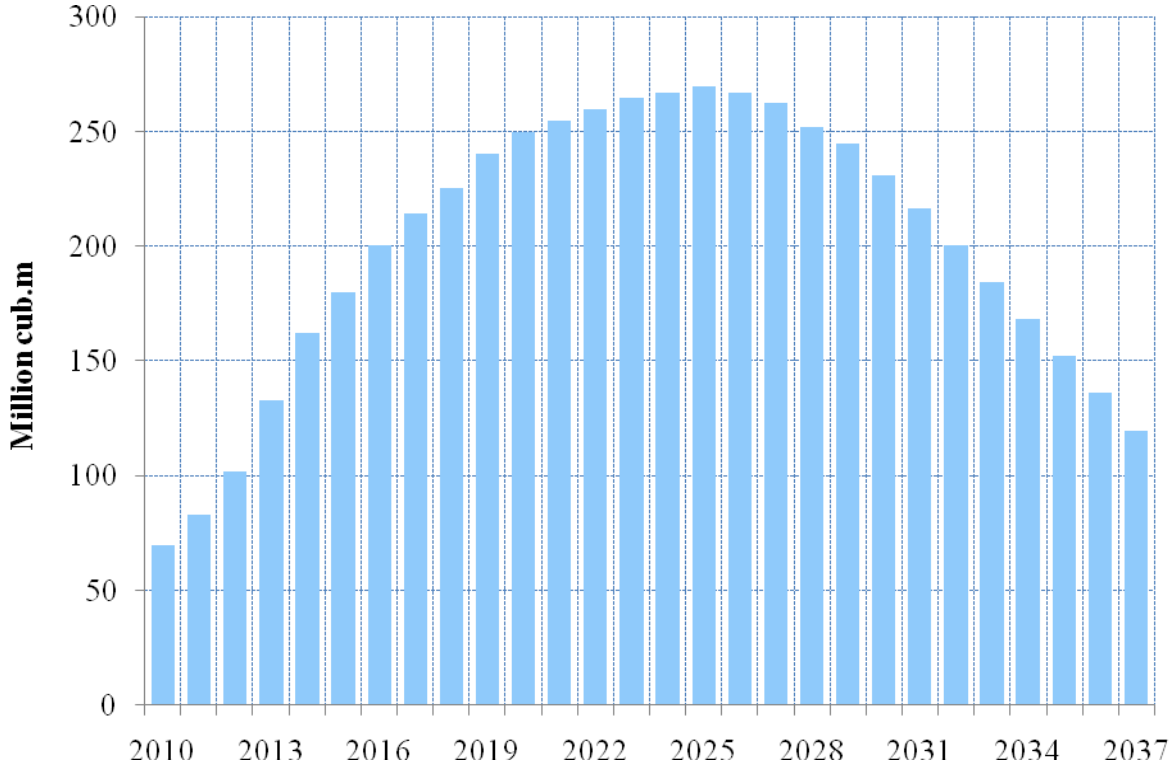
It is interesting that technology Gas-to-liquid (GTL) with the process of chemosynthesis Fischer-Tropsch (FT). First, other technologies of refinement are already working in Russia (methanol, LNG), second, the causes due to which this technology was not widespread in industry 50 years ago are not defined yet.

In this respect, since 2005 year regular monitoring of economical efficiency of GPP building project on the basis of GTL-technologies are carried out. In 2009 such researches except financial and economic indexes allowed to define at least one of the causes due to which GTL technologies percolate very slowly.

Let us suppose that subsurface user X couldn't manage to get access to gas-transport system, predicted profile of mining operation and decided to construct GPP. The plant is being constructed directly on the territory of production field in conditions of Thule.

As the GTL technology owns one key feature according to which the plant is started simultaneously and full out, “production shelve” (the volume of the feed that will be delivered to the processing during the whole period of the project realization) should be defined already at the first stage. According to the accepted profile, the “production shelve” is set at the level of 180 million m□.

Fig. 1 Production performance at the production field of subsurface user X



Source: business-plan of the company

Up to 85 thousand tons of GTL-production – high-quality petrol and motor fuel can be received from 180 million m□ annually. The cost of the plant with such capacity is estimated in 4 billion RUR.

Motor fuel will occupy up to 73% in composition of output. The rest will be allotted to the petrol. Evaluation of operating expenses structure showed that expenses for accelerators and absorbents are the main expenditures. Expenses for exploitation and repair of expensive equipment and also shop costs and factory overhead are the second expenditure.

Due to the production of final product expenses for excises will dominate. Reduction of profits tax rate positively influenced on economic success of the project.

In such way results of model building showed that the project of a small GTL-plant construction can be commercially viable.

Table 1. Analytical results of the project's economic efficiency.

Capital input, billion RUR	3,8
Capacity, thous. tons	84,5
inclusive of	
Motor fuel	46
Motor petrol –АИ-92	23
Discount, %	4
NPV, mln. RUR	344
IRR,%	4,98

Source: Author's calculation

However in the process of detailed discussion we come to the conclusion that economic success is just formality. The sensitivity analysis showed that there is no assurance coefficient and in actual practice this production is unprofitable.

Firstly, if production costs slightly decline (7% on motor fuel and 4% on petrol) the project becomes unprofitable. This means that during the whole period of realization dependence on volatile energy market will be high.

Secondly, high committed costs will not allow constructing a plant with total capacity less than 72 thous. tons.

Thirdly, the share of motor fuel in the production structure shouldn't exceed 75%, otherwise the project will lose its economic attractiveness.

The fourth, of course the specificity of production lies in simultaneous plant commissioning at full capacity. This demands high reliability extent of production forecasting in long-run period. In case of mistake, raw material shortage will precipitously increase operating expenses, net surplus of the gas will increase the fine sanctions. Considering a tenfold increase that is expected in Russia, the risks increase multiply.

Therefore exactly the necessity of accurate calculation of "production shelve" and also a considerable probability of error in production forecasting for 10-15 years doesn't allow companies considering the GTL-plants construction seriously. Long period of high prices on energy products could change the situation. At that time R&D in the sphere of GTL-technologies is being intensified, so probability, that technology of plants' placing in service by parts will be found, grows.