



НефтеХимКонсалт

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# Ishimbay's methanol plant (Republic of Bashkortostan) (up to 100 thousand tons of methanol per year)



The project is presented by a group of design, scientific and technical, petrochemical, service, installation and IT companies, as well as educational institutions of the Republic of Bashkortostan :

**LLC «Neftechimkonsalt»**, LLC «Hammel», LLC «Mezhregiontreid», PC «Salavatneftemash», LLC «PT-Group», LLC «Orgneftechimproject», LLC «Konkrit», FSBEI «USOTU» Salavat city, LLC «Severstroy».

Methanol is one of the key products of the chemical industry, which is a technological solvent and raw material for many products of organic synthesis.



At the beginning of 2018, the total capacity for methanol production amounted to 4.47 million tons in Russia. The average level of capacity utilization reached 93-96%. Further development of production becomes possible only if new plants are put into operation.

## Methanol consumption and production

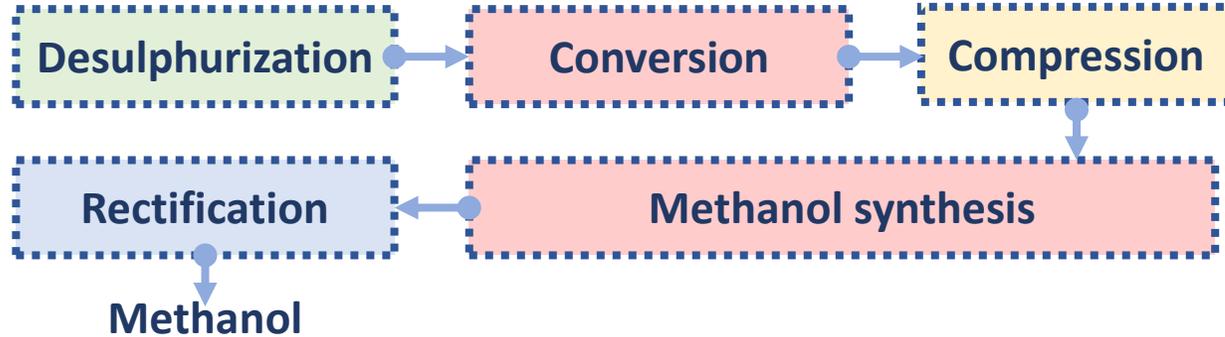
According to the forecast of experts, by 2027, the world demand for methanol can reach 135-137 million tons, an annual increase of about 5.5%. Methanol consumption in Russia by the end of 2017 increased by 8% and amounted to 2.4 million tons. The growth rate of consumption in our country is much faster than the growth rate of production.



The main applications of methanol: the production of formaldehyde and MTBE (high-octane additive to motor fuel); in the production of synthetic rubbers, acetic acid; methyl methacrylate, plastics, solvents, methylamines, methyl chloride; for drugs; as an additive to gasoline; as a denaturing additive to ethyl alcohol; application in fuel cells; as an industrial solvent; methanol is part of a number of antifreeze.

# Technical features of the project

The initial synthesis gas for methanol synthesis is planned to be obtained as a result of steam-air conversion of hydrocarbon raw materials: natural gas, oil gases.



## Methanol synthesis

**Raw:** the synthesis gas — mixture CO c H<sub>2</sub> (1:2)

**Ancillary materials :** catalyst (oxide Zn, Cr).

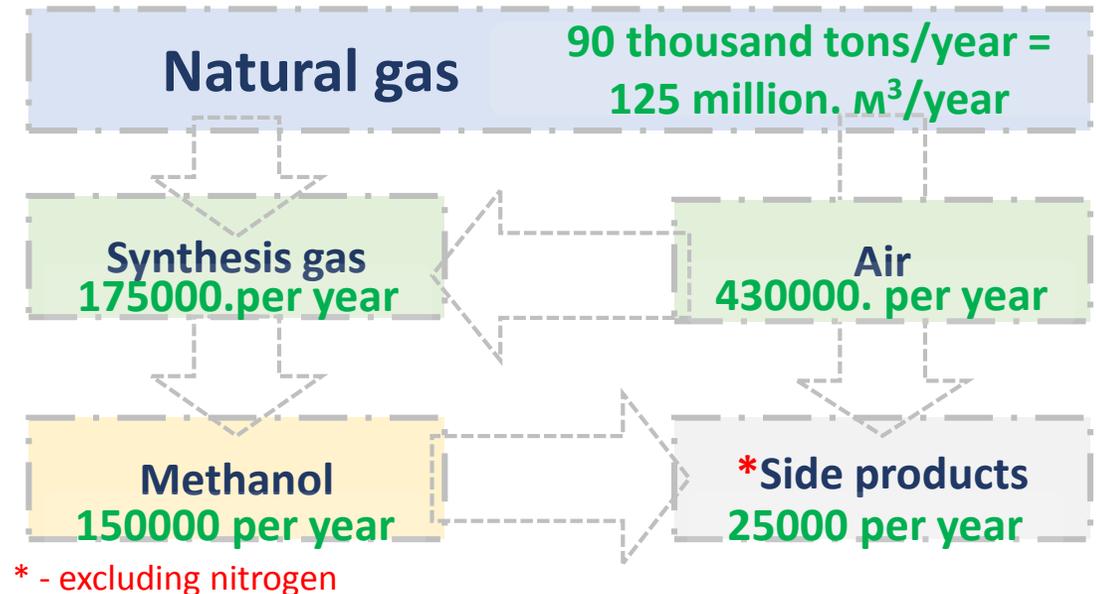
**Basic chemical process:** synthesis gas at temperature 380-420 °C and at a pressure of 25·10<sup>6</sup> Pa passes into methanol :



**Features of technological process :** when the gas mixture passes through the catalyst layer, 10-15% methanol is formed, which is condensed, and the unreacted mixture is mixed with a fresh portion of the synthesis gas and after heating is again sent to the catalyst layer (circulation). The overall yield of 85-90%.

# Material balance

The feasibility study of the project allows to make a choice in favor of the productivity of 150 thousand tons of methanol per year.



## Project status for the current period

The project is supported by the Government of the Republic of Bashkortostan, a site for the implementation of the project in the special economic zone of the Ishimbay district of the Republic has been determined. There is a decision to include it in the list of priority projects of the Republic of Bashkortostan, which provides for the return of up to 30 % of the invested funds in the form of benefits, subsidies and refunds. The project was defended by the investment Committee under the Head of the Republic. Design estimates will be completed in the course of the investment project.

# Economic indicators of the project

Project cost estimate in 2018 prices: 8.57 billion rubles.

Methanol capacity: 150 thousand tons per year.

Construction period: 2.5 years.

Demand for investments in 2018 prices: 8.57 billion rubles.

Number of jobs (staff cap.): 300 units.

Sanitary zone: 1 km.

The yield of finished product : 85-90%.

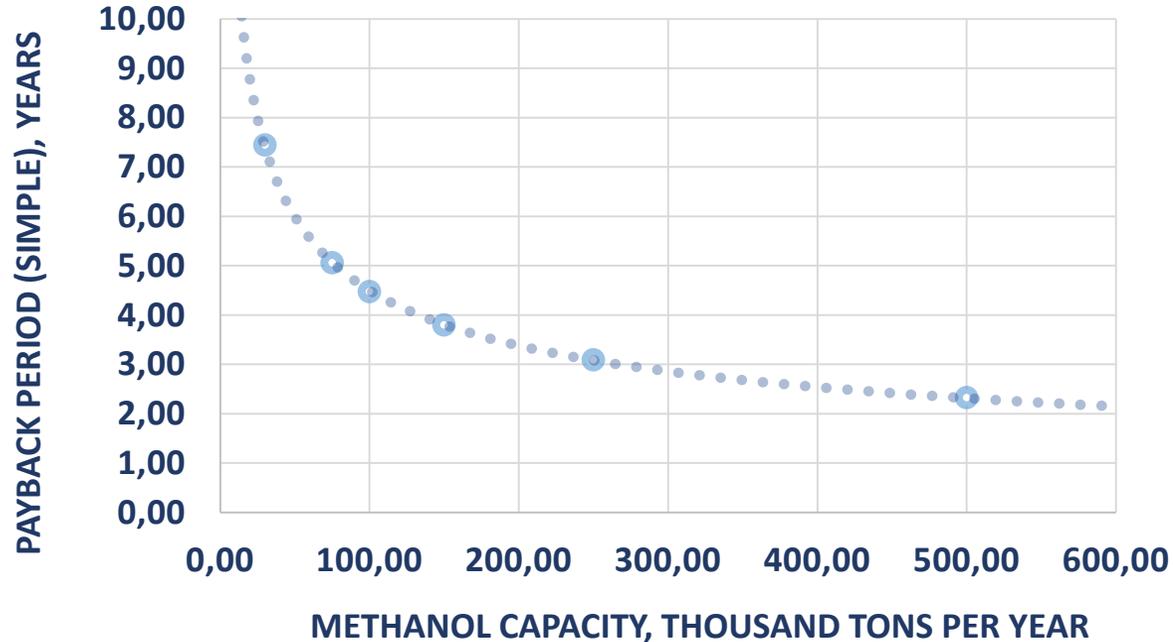
River water consumption : 40 m<sup>3</sup>/h.

Waste water consumption : 10 m<sup>3</sup>/h.

Electricity consumption : 7 MW.

Natural gas consumption : 16000 m<sup>3</sup>/h.

The land area of 8-10 Hectares



# Performance analysis

The carried out technical and economic calculation shows expediency of construction of production of methanol from 100 to 200 thousand tons a year. The upper limit is the risks of implementation at the initial market entry, logistics. The lower limit is the payback period of the project.

Indicator	Alternative design			
	75,00	100,00	150,00	250,00
Methanol, thousand tons per year	75,00	100,00	150,00	250,00
CAPEX, billion rubles.	5,71	6,75	8,57	11,60
OPEX, million rubles per year	532,4	709,8	1064,7	1774,5
Annual effect, billion rubles	1,13	1,51	2,26	3,76
Payback period, years	5,05	4,47	3,79	3,09

# Prospect of development

The planned production of methanol can be increased to 250 and further to 500 thousand tons per year through the construction of the second and third lines of production, if high indicators of the Russian market demand are achieved, as well as when contracts with Asian countries are signed (the deficit for 2019 is about 10 million tons).

# Thanks for your attention!



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