

Role of territorial Oil and Gas production Complexes in Socioeconomic Development of Russia's Eastern regions in the context of Energy Cooperation with APR Countries

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The paper deals with the problems of prospective socio-economic development of Russia's Eastern regions in terms of creation and development of territorial oil and gas production complexes (TOGPCs). A brief description of four TOGPCs to be created in East Siberia and the Far East is given and their contribution to the achievement of the most important indicators of accelerated economic growth in the East of the country is assessed.

Key words: resource potential, territorial production complexes, energy, sectors of oil and gas complexes, gas processing and gas-chemical production, adjacent industries, transportation, gross regional product

1. INTRODUCTION

Large hydrocarbon reserves available in the Eastern regions of Russia and their comprehensive utilization create preconditions for formation of new territorial oil and gas production complexes: South-Evenk (Krasnoyarsk Territory), Verkhne-Lensky (Irkutsk Region), West-Yakut (the west of Sakha republic (Yakutia)) and North-Sakhalin complex (the north of Sakhalin Region).

In Soviet times territorial production complexes were scientifically grounded and then created in some regions developing their resource potential, for example, Bratsk - Ust-Ilimsk territorial production complex that demonstrated high economic efficiency [1]. Later, in the post-soviet time a variety of options and interpretations of comprehensive development of territories and industries emerged. These were economic belts, areas, sectoral clusters, industrial complexes, agglomerations, etc, that are based on separate (often unrelated to each other) sectoral and territorial-economic priorities [2]. However, as practice shows the most justified and efficient form of productive forces organization in a certain area is

territorial production complexes (TPCs), in which large energy facilities are oriented to comprehensive processing but not supply of resources, and in which the conditions are created to involve other, non-energy, resources in the economy on the basis of common infrastructure (transport, energy supply, finance and credit system, etc.) [3-5].

Over the years of market reforms the state regional policy concerning development of regions in fact has abandoned the idea of overall development of territories, and now the regions rich in resources are developing according to individual most efficient projects which attract large private companies. This approach leads to huge economic losses for the regions, slows down their development and does not provide a well developed production and social infrastructure, a necessary economic growth and considerable increase in the standard of living. In our opinion it is high time to return to strategic planning on the basis of territorial production complexes and, first of all, in the Eastern regions of Russia.

2. CHARACTERISTIC OF TERRITORIAL OIL AND GAS PRODUCTION COMPLEXES

The territorial oil and gas production complexes are based on large efficiently operating oil and gas enterprises and infrastructural facilities of various levels of territorial hierarchy. Normally they cover several administrative units in the entities of the Federation. For example, the South-Evenk TOGPC includes southern part of Evenk area, Kezhemsky, Boguchansky areas and northern parts of North-Yeniseisky and Molyginsky areas of Krasnoyarsk Territory. There are two promising oil and gas bearing areas in this region: Yurubcheno-Takhomsky and Sobinsko-Teterinsky. Be-

sides, there are deposits of gold, antimony rare-earth metals, iron ore and alumina ore. Along with mineral resources the region has unique undeveloped wood reserves, i.e. raw material for development of wood and wood processing industry in the area of the territorial production complex.

The Verkhne-Lensky TOGPC includes Kantangsky, Ust-Kutsky, Kirensky, Zhigalovsky, Ziminsky and Irkutsky areas of Irkutsk Region. There are above ten oil and gas fields in this territory. The largest of them are Kovyktinskoye and Verkhnechonskoye. The mineral resources located in the territory of the considered TOGPC include Nepskoye potash salt deposit. There are also undeveloped wood resources that can be utilized for production of lumber and other wood processing products.

The West-Yakut TOGPC includes Lensky, Mirninsky, Nyurnbinsky areas and the northern part of Olekminsky area. There are several oil condensate fields in the territory of the TPC among which stand out Talakan-skoye, Chayandinskoye and Sredne-

Botuobinskoye. The strategic natural resource concentrated in the territory is diamonds (about 80% of all explored diamond-bearing ores of Russia). Besides, the territory is rich in wood resources.

The North-Sakhalin TOGPC includes 4 entire areas in the north of the island and the northern part of Tomarinsky area. All discovered and studied oil and gas fields in Sakhalin Island both offshore and onshore are situated in this territory. In fact creation of the TOGPC is underway. Natural resources concentrated in this territory include considerable reserves of natural materials, used in the construction industry, and undeveloped wood resources that can be used for creation of production facilities with advanced wood processing, and pulp-and-paper industry.

As of 01.01.2007 oil reserves of category A+B+C1+C2 onshore and offshore of the considered TOGPC account for 1550 m t, the reserves of natural gas – 6940 bn m³ (Table 1).

TABLE 1. RECOVERABLE OIL RESERVES (M T) AND NATURAL GAS RESERVES AND RESOURCES (BN M³) BY TOGPC (AS OF 01.01.2007)

Territorial oil and gas production complex, entity of RF	Oil reserves		Natural gas reserves and resources		
	Category of reserves		Category of reserves		Resources C3+D
	A+B+C1	C2	A+B+C 1	C2	
South-Evenk, Krasnoyarsk Territory	126	466	336	930	7988
Verkhne-Lensky, Irkutsk Region	196	74	1569	2457	7000
West-Yakut, Sakha Republic (Yakutia)	213	40	678	908	7845
North-Sakhalin, Sakhalin Region	254	181	47	18	267
Total	789	761	2630	4310	23100

Potential volumes of oil and gas production in the TOGPCs till 2030 are sufficient to meet the expected demand for hydrocarbon resources in these regions and APR countries in the context of their energy cooperation with the Eastern regions of Russia.

Entities of the Russian Federation that have TOGPCs are of important geopolitical sig-

nificance for Russia and are meant to ensure strong economic, demographic and geopolitical positions of the country in the East. This problem can be to a great extent resolved by creation of TOGPC which will make it possible:

1. to create efficient self-sufficient regional economic complexes on the basis of local resources.
2. to bring the level and quality of life in the Eastern regions closer to that in the advanced regions of the RF and APR countries.
3. to maintain the number of population living in this area and create conditions for its increase.

Table 2 presents a list of the main types of activities of TOGPC to be created. Tables 3-6 present the main forecasting indicators of the considered TPC development till 2030.

TABLE 2. MAIN TYPES OF TOGPC ACTIVITIES IN EAST SIBERIA AND THE FAR EAST

TOGPC	Industries of oil and gas complex				Adjacent industries						
	Oil and gas production	Oil refining	Gas processing	Pipeline transportation	Gas chemistry	Electric power	Mining	Gold, precious metals, diamonds	Non-ferrous metalurgy	Wood and wood processing	Railway transportation
South-Evenk	#		#	#	#	#	#	#	#	#	#
Verkhne-Lensky	#		#	#	#	#	#			#	#
West-Yakut	#	#	#	#	#	#	#	#		#	#
North-Sakhalin	#	#	#	#	#	#				#	#

* Sign # indicates the presence of activity in the considered TOGPC

The advantages of territorial and production complexes lie in the following:

- They offer the possibility of reducing significantly the share of resources in the products delivered (or exported) by the regions, and expanding product range through advanced processing of hydrocarbon and other natural resources.
- provide higher economic efficiency of the products obtained and higher value added, and, eventually, increase the revenues of

budgets of all levels, which creates favorable financial conditions for solving economic, social and environmental problems of the areas.

- create preconditions for better coordination between infrastructural investment of the State and investment strategies of business in the regions in terms of spatial development priorities;
- provide additional jobs and employment for local population.

TABLE 3. MAIN DEVELOPMENT INDICATORS OF SOUTH-EVENK TOGPC

Activity	Area	Year			
		2015	2020	2025	2030
Oil production, m t	Evenk	7.5	12.0	17.0	25.0
Gas production, bn m ³	Evenk	8.9	23.3	31.0	31.0
Gas processing and gas-chemical production	Boguchansky				
Gas processing, bn m ³	Boguchansky	8.2	17.0	17.0	17.0
Polypropylene production, thousand t	Boguchansky	85	170	170	170
Polyethylene production, thousand t	Boguchansky	800	1600	1600	1600
Gold production, t	North-Eniseisky	28.9	36	36	36
Production of iron ore concentrate, m t	Kezhemsky	3.3	3.3	3.3	3.3
Production of slabs, m t	Kezhemsky	2.0	2.0	2.0	2.0
Production of alumina, thousand t	Kezhemsky		400	400	400
Production of antimony, thousand t	Motyginisky		2.9	2.9	2.9
Production of rare – earth metals, thousand t	Kezhemsky			50	50
Production of wood and woodwork, m m ³	Kodinsky		2	2	2
Electricity production, m kWh	Boguchansky	1800	3600	4000	4000
Oil transportation by the oil pipeline Yurubchen-Nizhnyaya Poima (520 km), m t km		3900	6240	8840	13000
Gas transportation by the gas pipeline Yurubchen and Sobinskoye – Nizhnyaya Poima (700 km), bn m ³ km		6230	16310	27300	31500
Railway Boguchany – Baikit (380 km), m t km			2380	2400	2500

TABLE 4. MAIN DEVELOPMENT INDICATORS OF VERKHNE-LENSKY TOGPC

Activity	Area, town	Year			
		2015	2020	2025	2030
Oil production, m t	Zhigalovsky,	12.0	16.0	15.5	14.7
Gas production, bn m ³	Ust-Kutsky, Kirensky, Katangsky	11.1	35.5	39.2	41.0
Gas processing and gas-chemical production					
Gas processing, bn m ³	Ust-Kut		4.3	4.3	4.3
Production of helium concentrate, m m ³	Ust-Kut		13	13	13
Production of polypropylene, thousand t	Ust-Kut		50	50	50
Production of polyethylene, thousand t	Ust-Kut		400	400	400
Gas processing, bn m ³	Sayansk		5.5	5.5	5.5
Production of helium concentrate, m m ³	Sayansk		12.5	12.5	12.5
Production of polyvinylchloride, thousand t	Sayansk		500	500	500
Gas processing, bn m ³	Angarsk		30	30	30
Production of helium concentrate, m m ³	Angarsk		72	72	72
Production of polypropylene, thousand t	Angarsk		150	150	150
Production of polyethylene, thousand t	Angarsk		1400	1400	1400
Production of potash fertilizers, m t	Kirensky		2	2	2
Production of lumber, thousand m ³	Ust-Kutsky	600	600	600	600
Production of plywood, thousand m ³	Ust-Kutsky	100	100	100	100
Production of fiberboard, thousand m ³	Ust-Kutsky	80	80	80	80
Production of electricity, m kWh	Ust-Kutsky		2500	2500	2500
Oil transportation by the oil pipeline ESPO (420 km), m tkm		10500	10500	12600	21000
Railway Lena-Nepa- Lensk (550 km), m tkm			1404	1508	1650

TABLE 5. MAIN DEVELOPMENT INDICATORS OF WEST-YAKUT TOGPC

Activity	Area	Year			
		2015	2020	2025	2030
Oil production, m t	Lensky,	9.7	13.7	15.2	15.3
Gas production, bn m ³	Mirninsky	1.2	13.6	19.8	26.8
Oil refining, m t	Lensky	0.5	1	1	1
Gas processing and gas-chemical production	Lensky				
Gas processing b m ³	Lensky		12.6	18.7	25.7
Production of helium concentrate, m m ³	Lensky		80	110	160
Production of polypropylene, thousand t	Lensky		95	140	200
Production of polyethylene, thousand t	Lensky		860	1290	1700
Processing of diamond-bearing ore, m t	Mirninsky	1.5	6	6	6
Processing of diamond-bearing ore, m t	Nyurbinsky		0.8	0.8	0.8
Production of timber, thousand m ³	Lensky	931	931	931	931
Production of lumber, thousand m ³	Lensky	558.5	558.5	558.5	558.5
Production of biofuel, thousand m ³	Lensky	23.6	23.6	23.6	23.6
Production of electricity, m kWh	Lensky		3400	5000	6590
Oil transportation by the oil pipeline ESPO (500 km), m t km		10500	10500	12600	21000
Gas transportation by the pipeline Chayanda – Skovorodino (300km), bn m ³ km			3700	5500	7700
Railway Lena-Nepa-Lensk (550 km), m tkm			1404	1508	1650

TABLE 6. MAIN DEVELOPMENT INDICATORS OF NORTH-SAKHALIN TOGPC

Activity	Area	Year			
		2015	2020	2025	2030
Oil production, m t	Sakhalin shelf and dry land	20.9	16.5	15.3	14
Gas production, m m ³		31.4	50.5	58	60
Oil refining, m t	Tomarinsky		4	4	4
Gas processing and gas-chemical production	Tomarinsky				
Production of LNG, bn m ³	Tomarinsky		26.2	26.2	26.2
Production of propane-butane fraction, thousand t	Tomarinsky		223	223	223
Production of polypropylene, thousand t	Tomarinsky		160	160	160
Production of polyethylene, thousand t	Tomarinsky		1450	1450	1450
Production of methanol, thousand t	Tomarinsky		200	200	200
Production of cellulose, thousand t	Nogliksky		400	400	400
Production of brick, m pcs	Tymovsky	3	3	3	3
Production of cement, m t	Tymovsky	1	1	1	1
Production of electricity, m kWh	Tomarinsky		7250	7250	7250
Railway and passage through the strait of Nevelsky (125 km), m t km	Okhinsky			125	250

3. INTEGRAL ESTIMATION OF TOGPC EFFICIENCY

Gross value added was used as an integral estimate that characterizes socio-economic

efficiency of TOGPC for the region. Integral estimates of the kind are based on thorough consideration of investment projects for economic forecasting.

This approach was used to estimate the efficiency of the considered TOGPCs in four eastern entities of the Russian Federation.

The estimations show high efficiency of such territorial production complexes both in the industries of fuel and energy complex and in the adjacent industries.

For example in 2030 the share of projects in the adjacent industries in production of gross regional product in South-Evenk TOGPC will account for 34% (178 bn rub.), in Verkhne-Lensky and West-Yakut – about 28% (about 100 bn rub in each) and in North-Sakhalin TOGPC – 24.6% (123 bn rub).

TABLE 7. GROSS REGIONAL PRODUCT BY TOGPC (BN RUB)

TOGPC	Year			
	2015	2020	2025	2030
South-Evenk, total	172.8	313.8	455.4	527.0
including oil and gas complex	100.9	198.8	277.5	349.1
adjacent industries	71.9	115.0	177.9	177.9
Verkhne-Lensky, total	147.8	374.2	384.0	382.7
including oil and gas complex	143.9	265.4	275.1	273.8
adjacent industries	3.9	108.9	108.9	108.9
West-Yakut, total	102.0	234.3	291.2	343.8
including oil and gas complex	94.0	181.0	217.8	246.6
adjacent industries	7.9	53.2	73.4	97.2
North-Sakhalin, total	290.7	487.4	503.0	500.7
including oil and gas complex	288.6	364.4	379.9	377.6
adjacent industries	2.1	123.0	123.1	123.1

TABLE 8. INDUSTRIAL STRUCTURE OF GROSS REGIONAL PRODUCT BY TOGPC (%)

TOGPC	Year			
	2015	2020	2025	2030
South-Evenk, total	100	100	100	100
including oil and gas complex	58.4	63.4	60.9	66.2
adjacent industries	41.6	36.6	39.1	33.8
Verkhne-Lensky, total	100	100	100	100
including oil and gas complex	97	70.9	71.6	71.5
adjacent industries	2.6	29.1	28.4	28.5
West-Yakut, total	100	100	100	100
including oil and gas complex	92	77.3	74.8	71.7
adjacent industries	7.8	22.7	25.2	28.3
North-Sakhalin, total	100	100	100	100
including oil and gas complex	99	74.8	75.5	75.4
adjacent industries	0.7	25.2	24.5	24.6

4. CONCLUSION

Currently creation of oil and gas complexes in East Siberia and the Far East is at the initial stage. In order to provide the most effi-

cient development of new areas it is necessary to coordinate their development with the development of adjacent mining and processing productions. This approach of the State to development of natural resources in the Eastern regions of the country

could increase gross regional product by 27-30 % as compared to the implementation of some projects in the oil and gas industry alone.

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