

# **Assessment of Budget Efficiency of Fuel and Energy Complex Development in Russia's East in the context of Energy Cooperation with APR countries**

A.G. Korneyev, K.A. Bobkov

**The paper addresses the methodological approach to assessment of budget efficiency of fuel and energy complex development in the east of the country. The investment expenditures of budgets of all levels, that are required for energy development in the Eastern regions are compared with the tax revenues from fuel and energy complex to the respective budgets.**

**Key words: fuel and energy complex, electric power industry, coal industry, oil and gas complex, tax model, tax revenues, federal budget, regional budget, investment, budget efficiency.**

## 1. INTRODUCTION

The most important geopolitical goal of Russia is to strengthen economic and demographic positions of its Eastern regions.

There are huge reserves of hydrocarbon and hydro resources in East Siberia and the Far East. Therefore the role of fuel and energy complex (FEC) in accomplishment of the goal will steadily increase. This is related to both growing internal demand for energy resources for development of local energy-intensive productions in these regions and increasing economic and energy integration with the countries of Asia-Pacific region.

Decisions on large-scale development of energy resources in the east of the country and their utilization should be made provided that:

- the allocation of energy-intensive production facilities in the regions and cooperation with APR countries are substantiated with regard to the advanced processing of raw material;
- markets are determined;

- investors and suppliers of equipment (domestic and foreign) are determined;
- the use of foreign labor force (quotas) in the Eastern regions is coordinated not to prejudice the employment of local population and that involved from other regions of Russia;
- high socio-economic and budget efficiency is going to be obtained.

It is obvious that these conditions are basic. They are met not within individual business-projects but in the framework of socioeconomic and energy strategies and programs worked out for the macroregion of East Siberia and the Far East.

One of the most important efficiency indicators of FEC development in terms of increase in the standard of living of the population in the Eastern regions is a budget-tax component.

Budget efficiency of FEC should be assessed not only in terms of revenues coming from taxes to budgets but also in terms of budget expenditure on development of fuel and energy complex.

Projected energy resource production levels that underlie the assessment of budget efficiency of FEC in the Eastern regions are well defined in the Energy Strategy of Russia till 2030 and some regional strategies of FEC development [1-2].

According to the above documents in 2030 oil production will increase in East Siberia by 138 times, in the Far East – by 2.4 times; gas production – by 16 and 9 times, respectively; coal production – by 1.5 and 1.8 times and electricity production – by 1.8 and 3 times, respectively (Table 1).

TABLE 1. PROJECTED LEVELS OF ENERGY RESOURCES PRODUCTION IN RUSSIA'S EAST

Energy resource	2008	2015	2020	2030	
				Absolute value	in % of 2008
<b>Oil production, m t</b>					
Russia	487,6	495	525	535	110
<i>East Siberia</i>	0,5	33	52	69	13800
<i>Far East</i>	14	25	31	33	236
<b>Gas production, bn m<sup>3</sup></b>					
Russia	664	745	837	940	142
<i>East Siberia</i>	4	13	55	65	1625
<i>Far East</i>	9	40	67	87	967
<b>Coal production, m t</b>					
Russia	326	350	410	470	144
<i>East Siberia</i>	40	46	54	60	150
<i>Far East</i>	32	38	46	57	178

Energy types of activity are normally capital intensive and have a long payback period. Besides, many energy facilities are socially significant and are not cost effective. Therefore there is a need for the state financial support for development of fuel and energy complex industries, particularly in the eastern poorly developed regions.

## 2. INVESTMENT IN FEC DEVELOPMENT

Implementation of the strategic policy on FEC development in the Eastern regions till 2030 will call for more than 6300 bn rub. of investment including 3420 bn rub. for the FEC of East Siberia and 2910 bn rub. for the FEC of the Far East (Table 2).

TABLE 2. INVESTMENT IN FEC DEVELOPMENT IN EAST SIBERIA AND THE FAR EAST

Indicator	Period			Total, 2011-2030
	2011-2015	2016-2020	2021-2030	
<b>Investment in FEC of East Siberia, bn rub.</b>	<b>1240</b>	<b>985</b>	<b>1195</b>	<b>3420</b>
including budget funds	136	82	181	399
Specific weight of budget funds in investment, %	11	8	15	12
<b>Investment in FEC of the Far East, bn rub.</b>	<b>1395</b>	<b>665</b>	<b>850</b>	<b>2910</b>
including budget funds	120	75	168	363
Specific weight of budget funds in investment, %	9	11	20	12
<b>Investment in FEC of East Siberia and the Far East, bn rub.</b>	<b>2635</b>	<b>1650</b>	<b>2045</b>	<b>6330</b>
including budget funds	304	215	452	971
Specific weight of budget funds in investment, %	10	10	17	12

Specific weight of budget investment in the FEC of East Siberia in various periods may account for 11%-15%, and in the FEC of the Far East – 9%-20 %, which is lower than or equal to an average Russian share of approximately 21%.

In the structure of investment in the FEC of East Siberia on average for the considered period the share of power industry is 39%, heat economy – 9%, coal industry – 6%, oil and gas industry – about 46% (Table 3). In the total amount of investment in the FEC of the Far East the share of electric power

industry will be 30%, heat economy – 5%, coal industry – 6%, oil and gas industry – 59% (Table 4).

TABLE 3. STRUCTURE OF INVESTMENT IN FEC OF EAST SIBERIA BY INDUSTRY

FEC industry	Period			Total 2011- 2030
	2011- 2015	2016- 2020	2021- 2030	
FEC, total, percent, including:	100	100	100	100
Electric power industry	37	28	51	39
Heat economy	6	9	13	9
Coal industry	5	5	10	6
Oil production and oil refining industry, pipeline oil transportation	11	9	18	13
Gas production and gas processing industry, pipeline gas transportation	42	50	9	33

TABLE 4. STRUCTURE OF INVESTMENT IN FEC OF THE FAR EAST BY INDUSTRY

FEC industry	Period			Total 2011- 2030
	2011- 2015	2016- 2020	2021- 2030	
FEC, total, percent, including:	100	100	100	100
Electric power industry	23	25	44	30
Heat economy	2	5	10	5
Coal industry	4	6	7	6
Oil production and oil refining industry, pipeline oil transportation	33	14	27	27
Gas production and gas processing industry, pipeline gas transportation	37	50	12	32

For the East of Russia to achieve the energy production levels projected in the strategies the annual investment in FEC will have to be increased by more than 2 times on average for the whole period as compared to the

current volumes. Particularly important period for investment will be the five years to come. The volumes of investment should be increased by 3 times as compared to the actual ones over the last years (Table 5).

TABLE 5. REQUIRED AVERAGE ANNUAL INVESTMENT IN FEC DEVELOPMENT IN EAST SIBERIA AND THE FAR EAST, BN RUB.

Region	2008	Period			Total 2011-2030
		2011- 2015	2016- 2020	2021- 2030	
FEC of East Siberia	75	248	197	120	171
FEC of the Far East	72	279	133	85	146
FEC of East Siberia and the Far East	147	527	330	205	317

Solving the problems of FEC development in the Eastern regions requires a new effective investment policy of the government. The regions should obtain considerable tax, budget, technological and investment preferences. It is necessary to provide an easier access for foreign capital to development of

hydrocarbons, their processing and transportation. Currently the share of foreign investment in development of the economy in East Siberia makes up about 25%-28%, in the Far East – above 30%. Specific weight of foreign investment in the FEC of Russia is 24%. Under the conditions of limited

domestic investment it is sensible to increase this share to 40%-45%.

### 3. TAX REVENUES AND BUDGET EFFICIENCY OF FEC

Estimation of tax revenues from new developing energy complexes and large facilities in East Siberia and the Far East is a nontrivial problem. This is related to a number of objective and subjective factors generated by economic, tax and institutional systems.

In the conditions of uncertainty (often absence) of technical and economic, tax, institutional and other information on development of new energy facilities one of the simplest estimation methods is calculation of tax revenues by coefficients of tax payments per unit of energy resources produced at the capacities operating in various regions, for example, for oil and gas produced in Tyumen Region, coal - in Kuznetsk or Kansk-Achinsk basin, electricity produced in the Eastern regions. However, as the comparison of these coefficients for each energy resource shows they vary by region greatly and their direct use for new energy facilities can distort considerably a real picture of tax indicators. Below, Figures 1-4 present the

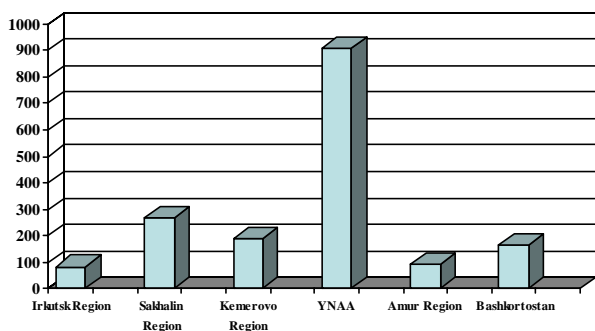


Fig.1. Tax revenues from power industry to budgets of all levels by RF entity, rub./1000 kWh

coefficients of tax payments for certain types of energy resources produced in different regions of the country. For example in power systems with a larger share of hydro power produced by hydropower plants (Irkutsk and Amur Regions) and with lower tariffs the coefficients of tax payments are lower by 3-9 times than in the power systems with the dominance of thermal power plants (Yamalo-Nenets Autonomous Area (YNAA) and Sakhalin Region) (Fig.1).

There is also a great difference in the tax payments from oil production by region. Oil produced in Tomsk region and in the Republic of Komi is the most efficient for the budget. Here tax payments per ton of oil produced are higher by almost 2 times than in Khanty-Mansi Autonomous Area (KMAA) and YNAA (Fig.2).

In gas industry the coefficients of tax payments in Krasnoyarsk Territory and Tomsk Region are higher by 9 and 3.5 times, respectively, than in the Republic of Komi and YNAA (Fig.3). Almost the same difference is observed in the coefficients of tax payments for oil refining (Fig.4).

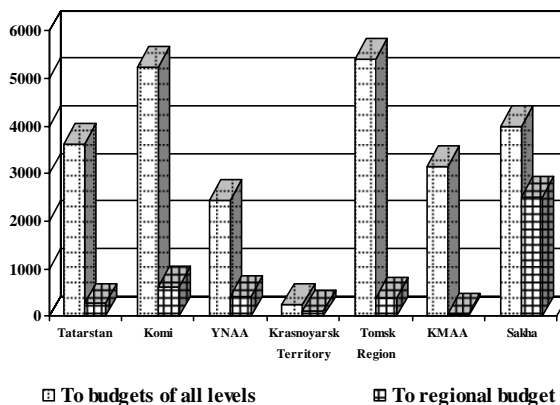


Fig.2. Tax revenues from oil production by RF entity, rub./t

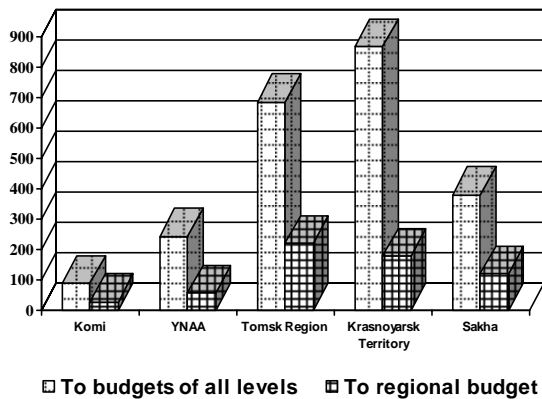


Fig. 3. Tax revenues from gas production by RF entities, rub./1000 m<sup>3</sup>

It is evident that the tax revenues from energy resources to be produced in new areas of East Siberia and the Far East should be calculated on the basis of local conditions of production and sales of energy resources (their costs and prices), used privileges and taxation forms (the traditional system, by production sharing agreements, in special economic zones, etc.).

Besides, an important issue is the extent of accounting tax revenues from producers. According to different estimations about a quarter of the potential volume of tax revenues is not received by the budgets. Basically this is explained by the shortcomings of the tax and corporate legislation that should be improved in terms of transparency of production and financial activities of enterprises.

In order to enhance accuracy of the estimates of tax revenues from FEC in new areas of primary energy production a special production-tax model has been developed at Melentiev Energy Systems Institute [4]. Its rough structure is presented in Fig. 5.

The production-tax model consists of six main logic modules:

- *module of production-sales activity*: volumes of energy product output are initial data of this module;

- *module of normative indices* that are calculated on the basis of design, statistical, expert and other data (capital intensity,

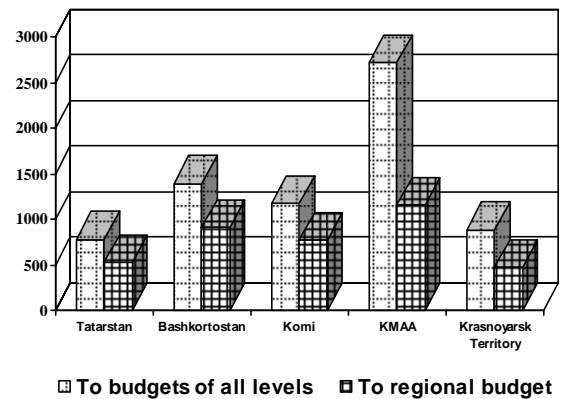


Fig. 4. Tax revenues from oil refining by RF entities, rub./t

labor intensity, material intensity of production and transport, etc.);

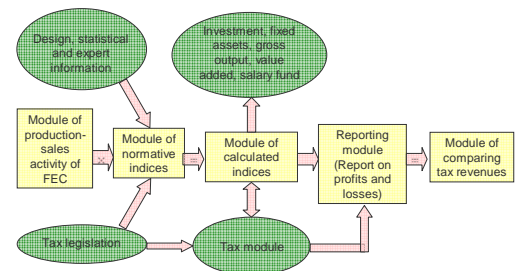


Fig. 5. Simplified diagram of the production-tax model of FEC

- *module of calculated indices*, the main of which are the required volume of investment in development of energy enterprises and transport of energy resources, volume of civil and erection works performed, traffic of energy resources from producer to their consumer, expenses on remuneration of labor, fixed assets of enterprises, etc.;

- *tax module* that represents a system of tax rates, tax and other payments remitted by energy enterprises (complexes) to budgets of all levels of the budgetary system in the RF;

- *reporting module* that submits the report on profits and losses of energy enterprises and complexes;

– *module of comparing tax revenues for variants (strategies) of development of FEC enterprises and complexes* that represents tax revenues to the budgetary system of the RF in the form of tables and diagrams, etc.

The model simulates the whole production process of large energy complexes (gas, oil, coal, electric power and so on), the so called macroenterprises, from their creation (in-

vesting) to attainment of a particular level of product output. In other words, a large integrated project or a fuel and energy base with specialized transport of energy resources is conditionally considered as a unified enterprise. There the annual results of production activity are presented as an aggregated report about profits and losses in accordance with the rules of financial accounting (Table 6).

TABLE 6. REPORT ON PROFITS AND LOSSES OF AN ENERGY MACROENTERPRISE

№	Item	Calculation order
1	Proceeds from energy product sales with VAT	
2	VAT, excises, export duties and other payments	
3	Proceeds (net) from energy product sales less VAT	Line 1-Line 2
4	Expenses on product output and sales (total cost), including.:	Sum of lines (5,17)
5	- Cost of product output:	Sum of lines (6,9-12)
6	• Material expenses, of which	Sum of lines (7,8)
7	Feedstock and materials, electric energy, fuel	
8	Works done by third-party organizations, including transportation	
9	• Expenses on remuneration of labor	
10	• Allocations for social needs	
11	• Depreciation of fixed assets	
12	• Other expenditures, of which taxes	Sum of lines (13,14,15)
13	mineral, land use, transport, water	
14	Property tax	
15	Environmental pollution charges, etc.	
16	Gross profit	Line 3-Line 5
17	- Business, management and sales expenses	
18	Profit on sales	Line 16-Line 17
19	Other incomes and expenditures	
20	Accounting profit	Line 18 + Line 19
21	Profit tax	[Line 20]*24%
22	Net (retained) profit	Line 20-Line 21

Here it becomes possible to arrange a taxable base and calculate tax revenues of the concrete new energy complexes considering their costs and proceeds from energy product sales.

Such a methodological approach allows determination of more sound indices of tax revenues by type of energy product on the corresponding territories as compared to calculations based on the averaged coefficients of tax payments of operating energy enterprises.

Implementation of strategic directions in energy development in the East of Russia will lead to increase in the annual tax revenues

(in comparable 2008 prices) from FEC by 2030 by a factor of 3 for East Siberia, 2.5 for the Far East and 2.7 for East Siberia and the Far East as a whole as compared to the current level. In 2030 they will amount to 572, 400 and 970 bn rub., respectively (Table 7). The taxable base of FEC in Russia's East will be formed mainly by the oil and gas sector and power industry. At 2030 level the share of oil industry in all tax revenues from FEC will make up above 73%, that of gas industry – from 11 to 15% and power industry – from 8 to 9.5%. About a quarter of all tax revenues from FEC will be directed to the regional budgets (Table 8).

TABLE 7. TAX REVENUES TO THE FEDERAL AND REGIONAL BUDGETS FROM FEC OF EAST SIBERIA AND THE FAR EAST, BN RUB.

Region, budgetary system	Year			
	2015	2020	2025	2030
East Siberia and Far East, total	621	826	904	970
- to consolidated budget of regions	157	199	216	234
- to federal budget	464	626	688	739
East Siberia	321	434	509	570
- to consolidated regional budget	81	107	123	140
- to federal budget	240	327	386	432
Far East	300	392	395	400
- to consolidated regional budget	76	92	93	94
- to federal budget	224	299	302	306

TABLE 8. STRUCTURE OF TAX REVENUES FROM FEC OF EAST SIBERIA AND THE FAR EAST, %

Industry	Year								
	2015			2020			2030		
	Federal budget	Re-gional budgets	Total	Federal budget	Re-gional budgets	Total	Federal budget	Re-gional budgets	Total
FEC, total, including:	100	100	100	100	100	100	100	100	100
Power industry	10.2	5.6	9	9.2	5.4	8.3	10.5	6.1	9.4
Coal industry	3.1	4.3	3.4	2.7	4.1	3.1	2.9	4.3	3.2
Oil industry	74.7	84	77.1	70.5	84.3	73.8	69.9	84	73.2
Gas industry	8.4	1.1	6.5	14.6	2	11.6	14.3	1.9	11.3
Oil refining industry	1.9	2.7	2.1	1.6	2.4	1.8	1.4	2	1.5
Oil transport by pipelines	1.4	1.8	1.5	1	1.4	1.1	0.9	1.2	1
Gas transport by pipelines	0.4	0.5	0.5	0.3	0.4	0.3	0.3	0.4	0.3

Comparison of the tax revenues and budget investment expenditures on FEC of East Siberia and the Far East reveals that the share of budget investment in FEC in its tax revenues is not high, making up from 3.5 to 7%,

and the invested budget ruble in FEC development brings in an annual state revenue in the form of direct tax revenues (on the average for the period) 21 rub. in East Siberia and 19 rub. in the Far East (Table 9).

TABLE 9. INDICES OF BUDGET EFFICIENCY OF FEC DEVELOPMENT IN RUSSIA'S EAST

Index	Period		
	2011-2020	2021-2030	2011-2030
<b>FEC of East Siberia</b>			
Budget investment (on average for a year), bn rub.	22	18	20
Tax revenues from FEC (on average for a year), bn rub.	310	540	425
Share of budget investment in tax revenues, %	7.1	3.4	4.7
Efficiency of budget investment in FEC, rub.	14	30	21
<b>FEC of Far East</b>			
Budget investment (on average for a year), bn rub.	20	17	18
Tax revenues from FEC (on average for a year), bn rub.	300	390	345
Share of budget investment in tax revenues, %	6.7	4.3	5.3
Efficiency of budget investment in FEC, rub.	15	23	19
<b>FEC of East Siberia and Far East</b>			
Budget investment (on average for a year), bn rub.	42	35	38
Tax revenues from FEC (on average for a year), bn rub.	610	930	770
Share of budget investment in tax revenues, %	6.9	3.8	4.9
Efficiency of budget investment in FEC, rub.	14.5	27	20

The analysis performed reveals high budget efficiency of FEC in the Eastern regions and attractiveness for the state to invest budgetary funds in this sector of the economy.

Full-scale development of energy resources in East Siberia and the Far East will give a powerful impetus to development of productive forces in the regions and provide an essential budgetary benefit.

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#### 5. BIOGRAPHIES



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