

THE PRESENT CONDITION AND PROSPECTS OF OIL SECTOR IN THE WORLD FUEL AND ENERGY COMPLEX

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The article gives the statistics of oil as one of the basic natural mineral resources. It is considered the situation with stocks of oil in regions and countries, the dynamics of its extraction, consumption, export, import, average year prices and the present state of the oil refining branch. It is also analyzed the prospects of world oil sector and the petroleum-refining industry in the near future years.

In March, 2006 OPEC promulgated “Long-term strategy” for forthcoming years. The strategy recognizes that the basic energy source in the world is oil and so it will remain.

According to the US Geological Management predicted resources of oil on

the Earth are estimated as more than 400 billions tons [1]. The confirmed stocks of oil in the Earth interior as estimated on 01.01.2006 come nearer to 200 billions tons (bln.t.) (Table1).

Table 1. The confirmed stocks of oil (millions tons) as estimated on 01.01.2006 [2]

Europe and Russia	Asia	Africa	America	Oceania and Australia	Total
17375,4	115316	1517,4	44108,9	513,6	192731,3

The stocks of oil are distributed among separate countries in an extremely unequal way. About two thirds of confirmed stocks of oil is located in 150 extra large objects, huge resources of oil are concentrated in the area of the Persian Gulf (64 % of official world reserves).

The leaders of oil stocks are: Saudi Arabia (36041, 3 millions tons (mln.t.)), Canada (24492, 1 mln.t.), Iran (18900 mln.t.), Kuwait (14329 mln.t.), Iraq (15512 mln.t.), Russia (14920 mln.t.), Venezuela (11678, 1 mln.t.).

It is necessary to note that at the present level of oil recovery its explored

stocks can provide the world for 43-45 years [1,3] while the developed countries are provided with oil for about 8 years, and at the countries of OPEC – for 81 years. [4]. The proved world reserves of oil are constantly increasing. In 1983 they were estimated at 723 billions barrels, in 1993 – at 1023, 6 billions barrels and in 2003 – at 1146, 7 billions barrels. During 1960-2002 the volume of stocks of oil in the world grew more than 4 times [5].

The world oil recovery is constantly growing and has reached 3, 68 billions tons by 2006 (Table 2).

Table 2. Dynamics of oil and condensate recovery (mln.t.) [2,6]

	1995	1996	1997	1998	1999	2001	2002	2003	2004	2005
Europe and Russia	619,57	627,73	630,85	628,71	643,18	672,1	700,0	714,93	751,43	746,21
Asia	1304,42	1325,52	1378,87	1421,11	1430,76	1452,64	1363,48	1468,11	1545,33	1570,65
Africa	339,21	371,32	376,01	345,2	334,46	356,27	344,93	376,23	422,3	444,26
America	830,55	860,08	882,45	889,03	846,54	858,56	856,99	877,95	897,83	898,72
Oceania and Australia	31,2	34,65	35,04	33,29	33,02	36,25	34,98	29,51	25,37	25,05
Total	3124,95	3219,31	3303,22	3317,34	3287,96	3375,82	3300,38	3466,72	3642,26	3684,89

Russia (12,75 %), Saudi Arabia (12,62 %), the USA (6,95 %), Iraq (5,28 %), China (4,9 %), Mexico (4,5 %), Venezuela (4,1 %), Norway (3,87 %), Canada (3,4 %) and the United Arab Emirates (3,3 %) have the greatest volumes of extraction.

The analysis of average year rates of oil recovery growth for 75 years demonstrates its stable decrease. So, if in period from 1930 to 1960 they made 5 %, in period from 1960 to 1990 - 3 % and in period

from 1990 to 2005 - on the average 1 % [7]. For each 30-years period average year rates of oil recovery growth fall by 2-3 %.

Today oil is the dominating energy source of the world energy system and its share in total energy consumption makes about 40 % and in a number of countries it reaches 60 % [8, 9].

Oil and oil products are traditionally used as motor and boiler oven fuel and also in the chemical industry.

Table 3. Dynamics of oil consumption (mln.t.) [3, 6]

	1995	1996	1997	1998	1999	2001	2002	2003	2004	2005
Europe and Russia	863,38	855,93	864	869,4	866,3	882,15	866,48	878,35	895,9	898,1
Asia	979	1037,02	1063,12	1036,83	1016,8	1204,71	1241,27	1284,79	1363,15	1389,66
Africa	72,3	76,1	78,3	79,5	80,3	117,9	116,53	119,41	123,23	128,51
America	1091,6	1136,5	1159,7	1187,4	1204,1	1284,2	1291,88	1304,63	1350,92	1354,47
Oceania and Australia	41	41,7	43,1	43,5	44,2	45,3	45,49	46,16	46,8	47,7
Total	3047,28	3145,25	3208,22	3216,63	3211,69	3534,26	3561,65	3633,34	3780	3818,44

The greatest consumers of oil are the USA (24, 7 %), China (8, 57 %), Japan (6, 4 %), Russia (3, 4 %), Germany (3, 18 %), India (3 %), Canada (2, 6 %).

The analysis of the dynamics of world oil consumption since the 1930-s years makes it single out some phases [8]:

1. 1945-1960 - the moderate growth. For these 15 years the average daily volume of consumption increased only by 10 million barrels.

2. 1960-1075 - rapid growth. In this period the world consumption increased 4 times.

3. 1975-1990 - stabilization of oil consumption at the level 60 million barrels per day.

4. 1990-2005 – the second phase of moderate growth. The consumption is 15-18 million barrels per day.

The logical analysis of these stages in the period from 2005 to 2020 lets us expect a phase of rapid growth of oil consumption.

The discrepancy between oil location and the regions of its consumption is one of the major factors of intensive development of the world trade.

The data on export and import in the world of oil are given in Table 4.

Table 4. Dynamics of export (a) and import (b) of oil from 2001 to 2005, mln. t. [2,6]

		2001	2002	2003	2004	2005
Europe(with Russia) Asia	a	401,78	401,48	404,24	426,7	417,8
	b	714,4	711,17	717,58	717,71	560,42
Africa America	a	883,62	828	871,12	962,53	981,07
	b	713,79	740,25	733,27	784,99	786,46
Ocenia with Australia	a	257,77	254,28	302,52	349,4	381,4
	b	57,7	58,39	55,55	64,4	62,53
Europe(with Russia) Asia	a	322,69	316,03	305,65	319,52	348,56
	b	620,91	588,45	641,12	654,59	648,74
Africa America	a	23,29	20,66	17,44	17,55	16,8
	b	26,09	24,02	23,67	24,33	25,1
Ocenia with Australia	a	1889,15	1820,45	1900,97	2075,7	2145,63
	b	2132,89	2122,28	2171,19	2246,02	2083,25

The greatest volumes of oil export are characteristic for Saudi Arabia (16, 3 %), Russia (11, 1 %), Iran (6, 3 %), the United Arab Emirates (5, 3 %), Nigeria (5, 1 %), the Great Britain (5, 1 %).

USA (22,5 %), Japan (9,35 %), China (5,65 %), South Korea (4,8 %), India (4,4 %), France (4,2 %) are leaders in the oil import.

Dependence of the developed countries on oil import currently makes about 55 %

and has a growing trend. According to the estimations of experts, it can increase up to 85 % by 2030.

Alongside with the capacity of the oil market the level of the world prices for oil is also a key factor. Any long-term forecast of the world prices for oil has always been characterized by a high degree of uncertainty and all of them have failed to be true.

Table 5. Dynamics of the mid-annual world prices for oil (dollars for barrel) [2, 6]

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Price	16,8	19,82	18,4	15,4	17,34	27,67	23,1	24,06	27,68	36,02	50,48

For the nearest decades it is predicted that oil will preserve its leading role in the world fuel and energy balance. Consumption of oil will increase but the rates of growth in different groups of countries will differ. On the whole the current forecasts predict average year rates of the consumption growth for the period up to 2020 at the level of 1,6 % - 2,2 %. Thus, the highest rates of the growth will be observed in developing countries and in the countries with transitional economy (2, 6 % a year). In the countries OECD (Organization for Economic Co-operation and Development) growth rates of oil consumption will be much lower (about 0, 8 %), including in the USA and

Canada - 0, 1 %, in Japan - 0, 3 %. In the period up to 2020 consumption of oil only in China and India will increase up to 600 mln.t. and 280 mln. t. accordingly. Though the markets of developing countries will be the most rapidly growing, such as markets of China and India, the markets of the developed countries will keep the position due to the great volume of oil consumption, accompanied by the depletion of their own resources. So in the USA and Canada the consumption of oil will make 1240 mln. t. in 2020, and in the EU - 685 mln. t. According to the forecast International Energy Agency (IEA) world consumption of oil should make

5, 2 bln. t. by 2020 and 6 bln. t. by 2030 (in 2000 - 34 bln. t.).

At the nearest three decades the demand for oil and oil products will grow. Concerning to the oil supply in the world market significant changes will take place in this sector. In spite of the fact that in the developed countries-exporters of oil the extraction and export of oil will be considerably reduced, exporters assume that the world petroleum industry can provide the necessary amount of oil to satisfy the growing demand. In conditions of the increasing of world prices the world oil recovery will be still concentrated in a small number of the countries. Along with the reduction of oil extraction in the USA and the Northern Sea the role of OPEC will increase. It is expected, that the share of this organization in the future extractions will increase from 38, 4 % in 2000 (1435 mln. t.) up to 40, 4 % in 2010 (1795 mln. t.), 48, 3 % in 2020 (2510 mln.t.) and 54, 1 % in 2030 (3245 mln.t.).

The reduction of oil recovery in the OECD countries and in developing countries such as China, India, other Asian countries, and also in the countries of Latin America, except Brazil, is predicted.

The most pronounced increase in oil recovery is predicted for the CIS countries and Russia. Here the oil recovery will increase up to 695 mln. t. in 2020.

Considering the present state of oil branch, it is necessary to pay attention to the issue of oil refining.

For the last decade capacities of world oil refineries have grown by 11 %, or by 430 mln. t. per year. The basic part of growth of capacities was in Asian-Pacific region (ATR). The number of oil refineries from 1995 to 2000 grew from 705 up to 743 basically due to the new factories in Asian-Pacific region. Since 2000 the number of oil refineries in a world petroleum-refining industry has been constantly decreasing.

Some characteristics of the world petroleum-refining industry are given in Table 6 [10].

Table 6. Petroleum-refining industry of the world

Parameters	Items	1995	2000	2001	2002	2003	2004	2005
Capacity	mln. t. per year	3826	4098	4142	4178	4196	4230	4256
Volume of processing	mln. t.	3151	3446	3489	3475	3564	3686	3830
Degree of capacity usage	%	82	84	84	83	85	87	90
Number of oil refineries		705	743	732	722	717	675	661
Average capacity of oil refineries	mln. t. per year	5,4	5,5	5,7	5,8	5,8	6,3	6,4

Current capacities on oil refining are distributed among the regions of the world as follows (%): Northern America - 24, 5; ATP - 26,1; the Western Europe - 17, 6; the East Europe and the former USSR - 12, 0; South America - 7, 8; the Near East - 8, 2; Africa - 3, 8. For the last decade the share of Northern America, the Western Europe, the East Europe and the former USSR has decreased,

but the share of regions ATR and the Near East has increased from 19, 4 up to 26, 1 %.

High technical level of equipment and sophisticated technology have allowed the USA increase the intensity of oil refining to 96 % - only 4 % constitute the output of boiler fuel and losses. This parameter is rather high in Canada – 96 %, Germany –

87 %, France – 86 %, the Great Britain – 85 %, Italy - 82, 5 %, Japan - about 82 % [11].

The different structure of technological processes in the world explains absolutely

different output of target products of oil refining (Table 7) [10].

Table 7. Output of the basic oil products in 2005, %

Mineral oil							
	Patrol	Diesel fuel	Kerosene	Jet fuel	Boiler fuel	Liquefied oil gas	Other products
World as a whole	25,7	27,3	2,4	5,8	13,3	9,4	16,1

The rates of growth of the petrochemical industry are higher than the rates of the growth of gross domestic product (GDP). This feature is observed over almost

50-years. The data on the rates of growth of world petrochemistry are given in Table 8 [10].

Table 8. Rates of growth of world petrochemistry, %

Parameters	1990-1996 гг.	1997-2004 гг.	2005-2007 гг.
World GDP	2,9	3,1	3,1
Petrochemistry	3,8	4,6	4,7

The world petrochemistry is a major consumer of raw materials. In 2004 it required for its needs 6, 5 % of oil, including industrially developed countries 8-10 %, developing countries - 2, 5 - 5, 0 %. The total profit of petrochemical production reached about 1, 7 bln. dollars in 2004. In the USA it makes 1300 dollars per capita, in the EU countries approximately 1000 dollars, in the countries of the East Europe and the former USSR - 160 dollars.

The share of the oil-and-gas companies in the production of basic petrochemical half products makes 60-90 %, intermediate products - 40-60 %, end products - 30-40 % in total production of petrochemicals.

In the structure of the leading oil-and-gas companies of the world the share of petrochemical sectors makes: in total profit - 6-12 %, in the net profit - 6-17 %.

Today the USA has reached 26 % in the volume of global petrochemical production, the West-European countries – 30 %, Japan – 10 %, developing countries ATR – 17 %, Near-East countries – 4 %, other countries - 13 %. Now, when the

analysis of the current state of oil refining has been made, we shall consider the forecast of consumption of oil products.

It is expected, that in the foreseeable future the demand for oil products will increase also by 1, 5 % a year and will reach 5, 7 bln. t. in 2030 against 3,5 bln.t. in 2000. Thus, the share of light and average distillates will grow in demand for oil products (gasoline, diesel fuel, aviakerosene). As a result by 2030 the consumption of motor kinds of oil products will make 82 % of the whole volume of consumed oil products against 78 % in 2000. The greatest growth of consumption of oil products, as well as oil, is expected in developing countries, first of all in China, India and the countries of Africa. More than 85 % of new capacities of oil refineries will be constructed in these countries and others, which are not members of OECD.

In the group of states with transitional economy, according to the forecasts of the IEA, the demand for oil products will increase by 2 - 2, 2 % a year on average.

The rates of expansion of capacities on primary oil refining, according to available forecasts, will be a little lower in comparison with the rates of growth of demand for oil products. So, according to IEA forecast, the growth of world capacities on primary oil refining in 2001-2020 will make only 1, 3 % per year on average in comparison with 3 % during 1991-2000. The decrease in the rates of growth of world capacities on processing is explained, first of all, by the development of modernization process of already available equipment. The construction of new capacities is expected mainly in economically developed states.

The growth of the share of import in covering the whole global demand for oil products can also be expected. Hence, the advancing growth of total world import demand will be kept approximately by 1, 8 - 2, 0 % a year on the average, or by 265-300 mln.t. up to 1015-1050 mln.t. in 2020.

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