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

Surzhikova O.A.
Tomsk Polytechnic University, Master of Economic Science
Tomsk, Russia

The article gives the statistics of coal 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 coal-mining branch. It is also analyzed the prospects of world coal sector in the near future years.

Coal has been a basis of the world fuel-energy balance for a long time. It surpasses in a total energy, it comprises, all the rest of fuel-energy resources taken together.

The world confirmed mineable reserves of this kind of raw materials make up 982,7 milliards of tons, including black coal – 518.2 milliard of tons and brown coal – 464,5 milliard of tons [1].

The world provision with coal explored reserves is as a whole high– 200 years [2].

The biggest total coal reserves are in the USA (246643 mln.t.), Russia (193771 mln.t.), China (114500 mln.t.), India (94620 mln.t.), Australia (97300 mln.t.).

The data on coal mining capacity in the world are represented in Table 2.

Table 1. Reserves of all kinds of the confirmed mineable coals on 01.01.2004 (mln.t.) [3,4]

	Total	Brown coals	Black coals
Europe (with Russia)	285596	159304	126292
Asia	266887	76278	190609
Africa	55093	347	54746
America	317347	151095	166252
Oceania and Australia	97873	42038	55835
Total	1022795	429061	593734

Table 2. Dynamic of the all-type coal mining (mln.t.) [3,4]

	1995	1997	1998	1999	2000	2001	2002	2003	2004
Europe (with Russia)	1177,1	1113,5	1052,4	1017,6	1024,8	1045,2	1012,2	998,5	977,2
Asia	1950,3	2036,5	1885,6	1632,2	1626,9	1803,4	2069,4	2326,0	2699,4
Africa	214,6	227,7	231,4	231,1	231,5	229,9	227,4	242,6	242,0
America	1061,4	1121,5	1145,4	1126,6	1106,9	1157,3	1134,6	1106,1	1158,2
Oceania and Australia	248,0	278,5	291,3	297,1	314,2	335,4	344,2	354,7	359, 8
Total	4651,4	4777,7	4606,1	4304,6	4304,3	4571,2	4787,8	5027,9	5436,6

Leading countries in miming all-type coals are (according to 2004 survey, mln.t.): Germany (211,05), Poland (161,21), India (402,5), China (999,17), the Republic of South Africa (225,3), the USA (976,72) and Australia (310,62).

The above mentioned countries are very likely to remain the main coal producers. More over, China is planning to increase annual mining capacity up to 2.0 milliards of tons by 2010, and the USA – up to 1,4 milliards of tons. There is also a growth trend of the coal mining in Columbia, Venezuela, Indonesia, Vietnam.

At the same time (during the same period) coal mining capacity in Europe is re-

ducing. The biggest decrease in production is in Great Britain (by 22%) and Ukraine (by 21,7 %).

While coal consumption in Europe, America and Oceania with Australia is practically stabilized both in the region as a whole and in each country, there is a growth trend in its consumption in Asia and Africa. The largest coal consumption was in China during 2000 - 2005 (increase by 108 %), Indonesia (by 103 %), South Korea (by 27,7 %), Japan (by 27,7 %), India (by 22,6 %), Kazakhstan (by 17,2 %).

Table 3. Dynamic of all-type coal consumption (mln.t of standard fuel) [3,4]

	1995	1997	1999	2000	2001	2002	2003	2004	2005
Europe (with Russia)	781,5	736,4	688,7	662,6	669,7	657,5	695,2	678,1	673,6
Asia	1498,6	1599,4	1380,7	1395,6	1411,4	1637,3	1873,5	2202,5	2387,0
Africa	122,5	130,8	128,0	118,9	120,1	121,6	131,9	139,8	136,0
America	797,4	850,3	939,5	909,9	901,2	894,6	872,9	915,7	231,5
Oceania and Australia	62,4	70,4	68,5	71,7	71,9	74,7	76,4	80,0	79,8
Total	3262,4	3387,3	3205,4	3158,7	3174,3	3385,7	3649,9	4016,1	4207,9

According to the forecast of the international energy agency (MEA) coal consumption will stably grow up to 2030. On average, demand for coal during 2000-2020 is going to increase by 1,4 % annually. By 2030 the world needs of coal will have made up 7,3 milliards of tons and will provide 22 % of the demand for energy resources [5]. This is explained by expected increasing needs of power industry. One more important conclusion: India and China will have 80% of the increased demand for coal to provide the energy balance [6].

A geographical structure of the coal consumption is also going to change in the nearest decade. Demand for coal will rapidly increase during 2000-2020 in developing countries, as well as in countries with transition economy in Asia, the Near East, the Middle East, Latin America (by 2,8 % annually). As a result by 2020 a unit weight of Asian countries in the world consumption will have made up 49 %, in 2030 – up to 54 % (in comparison with 40 % in 2000). By 2020 the share of OECD countries in the total coal consumption will have reduced by 37 %, by 2030– by 32 % (2000 – 46 %).

Table 4. Dynamic of export and import of black coal (mln.t.) [3,4]

		1995	1997	1998	1999	2000	2001	2002	2003	2004
Europe (with Russia)	Exp.	78,2	66,1	67,9	67,3	82,2	86,6	82,1	94,9	98,8
	Imp.	193,0	197,0	192,3	167,5	209,1	230,0	212,8	233,0	236,6
Asia	Exp.	84,9	102,3	108,3	112,7	142,7	189,1	186,7	208,4	229,0
	Imp.	244,5	275,1	268,6	273,0	320,7	332,6	368,5	382,9	249,6
Africa	Exp.	59,7	59,0	62,2	66,6	69,9	66,7	61,7	71,5	67,8
	Imp.	5,4	5,5	5,4	5,0	6,2	8,2	6,9	5,2	20,8
America	Exp.	136,6	144,1	139,3	122,2	128,9	120,0	101,5	110,6	119,6
	Imp.	34,7	42,4	46,8	45,1	54,1	63,3	61,2	67	64,4
Oceania and Australia	Exp.	137,5	159,0	168,2	172,8	186,8	194,0	203,9	207,7	223,7
	Imp.	0,2	0,4	0,5	0,4	0,3	0,3	0,3		
Total	Exp.	496,9	531,5	545,9	541,6	610,5	656,4	635,9	639,1	738,9
	Imp.	477,8	520,4	513,6	491,0	590,4	634,4	649,7	688,1	571,4

The dynamic of the world import and export of coal is illustrated in Table 4.

The biggest part of coal is used in countries-producers, nevertheless, the world commerce capacity of coal continues to grow.

Principal coal importers are Japan (179,8 mln.t. in 2004), Germany (41,6 mln.t.

in 2004), Great Britain (36,1 mln.t. in 2004) and the USA (24,7 млн.т. в 2004 г.).

Leading exporters are Australia (223,7 mln.t. in 2004), Indonesia (105 mln.t. in 2004), China (102 mln.t. in 2004), Russia (72 mln.t. in 2004).

Significant changes in a branch structure of coal consumption are also expected. The demand for coal from power industry sector is going to increase the most rapidly. This branch share in a total consumption of black coal will increase up to 79 % in 2030 (in comparison with 69 % in 2002). This will in long-term outlook be caused by an expected rise of coal competitiveness in comparison with other types of fuel, taking into account a forecasted more slow price growth.

Table 5. Branch forecast for coal consumption [7]

	2002	2030
Total	100	100
Power industry	69	79
Industry	16	12
Housing complex	3	1
Прочее	12	8

From the table we can see that coal consumption in industries will decrease and its unit weight in the total coal consumption will have reduced by 2030 by 12% (in comparison with 16% in 2002). Demand growth for industrial coal (coking coal, first of all) will make 0,5 % annually. At the same time, a trend of coal consumption reduction and its replacement by gas application in industries of OECD countries will take place. While the demand for coal in developing countries will be increasing as a result of demand growth from the heavy industry, first of all, from a ferrous metallurgy sector. Use of coal in domestic and commercial sectors will also decrease, most rapidly in OECD countries.

A keen change in the structure of orders made on turbines for electric power stations testifies preference towards coal used as a fuel. Whereas in 1997-2001 about 60% of orders for equipment were the orders for gas stations and 25% - for coal stations, 40% are orders for turbines for coal electric power stations, and a share of orders for gas stations will reduce up to 25% within the next decade [8].

Coal consumption by electric power stations started to grow a few years ago, which was caused by economical reasons, - an average price for gas per standard fuel unit is twice as much as for coal.

The majority of countries with a stable economy, prices for coal (in an equivalent ratio) are essentially lower than prices for gas and oil products. That is why in the world economy coal is more preferable rather than any other types of fuel. Thus, the share in generation of electrical energy from coal in the USA, the country with the most strict market economy, is 52%, in Germany, the country with a socially-oriented economy, – 54%, in Russia – 26%, in China, the country with a transition economy – 7% [9].

Nevertheless, according to analyst opinion, it is quite difficult to switch from gas to coal. And this switch will not be large-scale. First of all, transition of electric power stations from gas fuel to coal fuel is not cheap. Secondly, public opinion will always be against it because of ecological reasons.

Anyway, transition of electric power stations from gas to coal may last 10-20 years and shall be considered as a problem of future.

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