SATE AND TRENDS OF THE GAS SECTOR IN THE WORLD FUEL-ENERGY COMPLEX

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The paper present statistical material and analysis of one of the natural fossil power resources – gas. A situation of gas stocks in various regions and countries, dynamics of its extraction, consumption, export, import and average annual prices have been analyzed for the past several years. In addition trends of the world gas sector for the nearest future have been considered.

The International Gas Union values the world natural gas reserves at about 400 тtrillion cubic meters, while confirmed reserves make up only about 170 тtrillion cubic meters [1]. The world explored reserves in [2.3] (table 1) make up about the same value.

The largest reserves of gas are in Russia (27,4%), Iran (15,4%), Qatar (14,9%), Saudi Arabia (3,9%), the United Arab Emirates (3,5%), the USA (3,3%), Nigeria (2,9%), Algeria (2,8%), Venezuela (2,5%).

Dynamics of increase in the world reserves of natural gas is favourable. Thus, confirmed reserves in 1983 were 92,68 тtrillion cubic meters, in 2003 – 175,78 тtrillion cubic meters [4]

State-of-the-art technology of natural gas production (table 2) guarantees explored reserves of gas to the world community for 63 yeras [5].

Table 1. World explored reserves of gas, dated of beginning of (milliard cubic meters) [3,4]

Regions	Europe and Russia	Asia	Africa	America	Oceania and Australia	Total
Capacity	54002,1	86944,1	14085,3	14577,3	4066,8	173675,7

Table 2. Dynamics of natural gas production (milliard cubic meters) [2,3]

	1995	1997	1999	2000	2001	2002	2003	2004
Total	2624,2	2696,4	2851,9	3079,5	3156,0	3202,7	3313,1	3414,2

As you can see fro table 2, natural gas production has increase by 30.1% from 1995 to 2004.

The following countries have got the largest capacity of gas production: the USA (20%), Russia (19,2%), Canada (6,3%), Algeria (5,3%), Iran (3,9%), Norway (3,7%) Great Britain (3%).

Gas use in the world is constantly rising. According to [2,3] its consumption has increased by 30% from 1995 to 2004 (table 3).

Table 3. Dynamics of natural gas consumption (milliard cubic meters) [2,3]

	1995	1997	1999	2000	2001	2002	2003	2004
Total	2221,6	2343,2	2430,7	2495,6	2531,2	2604,0	2685,2	2779,7

Table 4. Dynamics of export (a) and import (b) of natural gas in the world (milliard cubic meters) [2,3]

		1995	1997	1999	2000	2001	2002	2003	2004
Total	а	493,0	520,8	564,1	617,8	609,4	706,6	748,7	789,9
	б	491,9	521,6	563,0	625,4	654,0	706,8	740,9	780,9

The largest gas consumption falls to the share of the USA (22,7%), Russia (15,9%), Great Britain (3,7%), Germany (3,6%), Canada (3,4%), Iran (3,1%), Japan (3,0%), Italy (2,9%).

The largest capacities of gas export falls to the share of Russia (25,1%), Canada (13,3%), Norway (9,6%), Algeria (7,6%), the Netherlands (6,8%), Turkmenistan (5,3%), Indonesia (5,0%), the USA (4,9%).

The biggest importers of natural gas are the USA (15%), Germany (11,4%), Japan (9,7%), Ukraine (8,8%), Italy (8,5%), France (5,7%), South Korea (3,8%), Spain (3,4%).

In the nearest thirty years the following countries are likely to have the most rapid rates of gas consumption growth: China (5,4% per year), African countries (5,1%), countries of South Asia (3,8%), Latin America (4,1%). Demand in the countries of the Organization of economic cooperation and development (OECD) will grow more slowly: Western Europe–2,1%, Asian-Pacific region (APR)- 2,3%, USA and Canada – 1,7%.

Table 5. Forecast of the world demand for natural gas [6]

	2002	2010	2020	2030	Average annual rates of the demand growth,%
	Milliard cubic meters				
World, total	2622	3225	4104	4900	2,3
OECD	1380	1624	1924	2154	1,6
North America	759	866	1002	1100	1,3
Europe	491	585	705	807	1,8
EU	471	567	684	786	1,8
APR	130	173	216	246	2,3
Countries with transition economy	635	728	863	984	1,6
Russia	415	473	552	624	1,5
Other	220	254	311	360	1,8
Developing countries	597	864	1307	1753	3,9
China	36	59	107	157	5,4
Indonesia	36	53	75	93	3,5
India	28	45	78	110	5,0
Other Asian countries	109	166	242	313	3,8
Brazil	13	20	38	64	5,8
Other countries of Latin America	89	130	191	272	4,1
Africa	69	102	171	276	5,1
The Near and Middle East	219	290	405	470	2,8

Because of a rapid rate of gas consumption in developing countries, first of all, in China a geographic structure of gas consumption will change. A specific gravity of OECD countries in the world consumption within 2000-2030 will reduce from 52% to 49%, for countries with developing economy – from 24% to 19%, while the share of developing countries will rise from 21% to 32%.

A branch structure of gas consumption will change. Within 2000-2020 the demand for natural gas in the world electrical power engineering is likely to rise rapidly, with an annual rate of 3,2%. This will involve increase in a specific gravity of natural gas in

fuel consumption in electrical power engineering up to 27% as compared to 21% in 2002 (in 2030 - 29%). Transition of the world electrical power engineering to gas will ensure rise if the coefficient of efficiency of a plant up to 62% (2030) in comparison with the coefficient of efficiency of a plant, running on coal (43-44%). This process will be especially fast in European countries where a specific gravity of gas in energy resources consumption will increase from 15% in 2000 to 41% in 2030.

Gas consumption in an industrial sector will distinctly rise, especially in petrochemical industry where gas is used as a raw material. By 2010 an expected minimum volume of gas processed to liquid synthetic fuels is going to make up 29 milliard cubic meters as compared to 4 milliard cubic meters in 2000. By 2030 gas consumption for these purposes will make 233 milliard cubic meters.

An increasing demand for gas responds to the interests of OPEC, The Organization of the Petroleum Exporting Countries, where the world largest gas stocks are accumulated (42% of the total stock), while they are producing just 14% of the worldwide gas production.

Introduction of condensed gas fuel (CGF) in the international trade is going to develop rapidly. At present the CGF share in the international trade of gas is 27,4%. By 2020 the CGF share in the total capacity of gas market is expected to rise up to 31-37%. Export of CGF to Asian countries is about 70% from the total capacity of CGF in the international trade channels, about 27% of CGF are exported the Western Europe countries, the rest - to the USA. At the moment the growth rates of CGF demand is almost twice as high as a demand for pipe-line supply. In 2002 gas import via pipe-line systems increased by 2,6%, while the CGF supply - by 4,3%.

Increase in the growth rate of CGF trade is caused by a significant reduction of prices on this type of fuel. For the past ten years a cost price of production and transportation of CGF have been reduced by 35-50% an a reduction trend of expenses still remains.

The first stage of CGF trade development was stipulated by impossibility to produce fuel by another method. At present there are a number of other reasons: assurance of supply instead of depleted own resources and a wish diversification of importing resources.

Markets of natural gas are regional since gas supply is tied to pipe-line. However, rapid spreading of CGF trade is likely to globalize this market. At present CGF prices are fixed for each transaction. Though, it is not inconceivable that prices on condensed gas will be exchange quoted.

An American consulting company «Cambridge Energy Research Associates» («CERA») is expected that in medium-term outlook CGF production may become the second important business in the global electrical power engineering sector. This is caused by two factors – sharp rise in supply and increasing demand worldwide, especially in the USA. By «CERA» calculations in the nearest 8 years it is necessary to build up production capacity of CGF the same as was built up fro the past 40 years. At the moment production capacity of CGF in the amount of 60 million tons per year have been already coordinated and are at the construction stage in Asia, the Near and Middle East and in countries of the Atlantic region.

Expansion of production of CGF is caused by intention of the countries with significant stocks of natural gas to actively use with a view of profit maximization. Qatar, Nigeria, Trinidad and Tobago, Australia are among these countries. Development of production is also possible in Iran, Angola and Venezuela.

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