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The papers study the following problems: sustainable development of local production systems, business strategies of LPS, innovativeness of clusters, critical infrastructure protection, corporate social responsibility, environmental protection, local production system management, governance of local production systems in Bulgaria, Poland, Ukraine and Russia, policy guidelines with some measures of general application, aimed at problems observed in all LPS, and some specific measures differentiated according to a typology of local production systems.

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STRATEGIES OF COAL BUSINESS DEVELOPMENT AND ECONOMIC SECURITY OF KUZBASS

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The coal industry of Kuzbass is the main driver of its economic development: it fills the regional budget (about one third of all payments in the consolidated budget of the region); it creates jobs (approximately 10% of the regional employment); it stimulates the development of infrastructure industries and steadily is the "center of gravity" of investment (almost half of the investment in fixed capital region; in 2013 about 65 billion rubles were invested in the modernization of Kuzbass coal industry). The growth dynamics of Kuzbass gross regional product (GRP) also demonstrates its high dependence on the coal production in the region.

At the same time, experts estimate the role of the coal business in the future quite ambiguously. Below is an attempt to describe the basic strategies of the coal business development.

STRATEGY OF TRADITIONAL DOMESTIC MARKET GROWTH

Domestic demand usually plays the role of a driver in a national economy. But in Russia the increase of demand particularly for power plant coal is unlike because of the progressively increasing production of natural gas. Since the beginning of 1990s the country has witnessed a steady decline in the demand for coal in the main segments of the domestic market. Over 20 years coal consumption decreased in metallurgy – by almost 1.5 times, in electric-power industry – by 1.4 times, housing and communal sector and the agricultural sector – by 1.6 times. In the Russian energy balance during the same period the share of coal decreased by 2%[4].

However, the government set up a target to increase the consumption of coal in the domestic market in Russia by 0.8% annually through the development of coal generation in the future[5]. By 2030 the country plans to enter about 26 GW of additional generating capacity based on coal. And although the strategic documents relating to the prospects of

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[4] Novak A. Reference points ambitious enough // Coal Kuzbass. – January–February 2013. P.7.

[5] Shmatko S.I. About the resume of restructuring and development prospects of the coal industry // Materials of the meeting at Prime Minister Vladimir Putin on the development of the coal industry (January 24, 2012, Kemerovo); Long-term program of development of coal industry of Russia for the period up to 2030. – URL: http://www.rosugol.ru/upload/pdf/project_dp.pdf

Russian electric-power industry declare a gradual decline in gas consumption, with increased volumes of coal consumption in power plants, but in practice, is bucking the trend. In our view, there is no reason to expect to perform voiced above forecasts. Most of the new projects in the generation associated with the gas consumption. The largest Russian gas companies increasingly claim plans to increase gas supplies to the domestic market. Besides the "big electric-power industry" and housing and communal sector are discussed (and already are realized) gasification projects transport.

Commercial investors' interest in the development of coal generation occurs only when you three-fold increase in gas prices in the domestic market (this figure may be different by regions depending upon a number factors) according to expert estimates. But now the slowdown in growth in domestic prices for natural gas is actively discussed.

There are several possible scenarios of generation market development, but they ultimately will not lead to increased consumption of thermal coal in Russia. On top of everything else, a considerable part of the domestic market (housing and communal services, state agencies) is some kind of a "black hole" for the coal companies: they get payment for the products they supply a long time afterwards. As a result the debt burden of companies is billions of rubles. Many Russian regions set up the upper limits of coal prices for housing and communal sector and for the population.

Domestic coking coal market is limited in Russia, and its main actors are included in the major steel holdings, whose activities, including plans for the development of production, depends on the situation on the domestic and foreign markets steel products. The import of coal – especially coking coal – is growing in Russia (in 2011 imported 2.6 million tons against 175 thousand tons in 2000[1]).

STRATEGIES FOR THE DEPLOYMENT OF COAL EXPORTS

Given the situation in the domestic coal market, where unlikely in the near future there will be major structural changes, which will lead to increased demand for this type of fuel, as well as the impossibility in the coming years to achieve the desired results in innovative industries, export of coal from Kuzbass is the only way of survival and development of the coal companies and the region as a whole.

Almost 100% of the addition coal production in the Kuzbass is the potential for coal export, and reduction in coal exports are decline of coal production, as a result, reducing economic security (Figure 1). In this connection it is extremely important to create *the right strategy exports*, considering the main threats related to the sharp change in the trend of the global economy, global energy and formation of a new configuration of the major coal markets.

For compression the domestic market and increase exports significantly increases the risk of the coal business in Kuzbass. If the price of Russian power plant coal, which provides economic efficiency of delivery (FOB ports of the Far East) is around $90/t, then analogous indicator for Australia – $45/t[2].

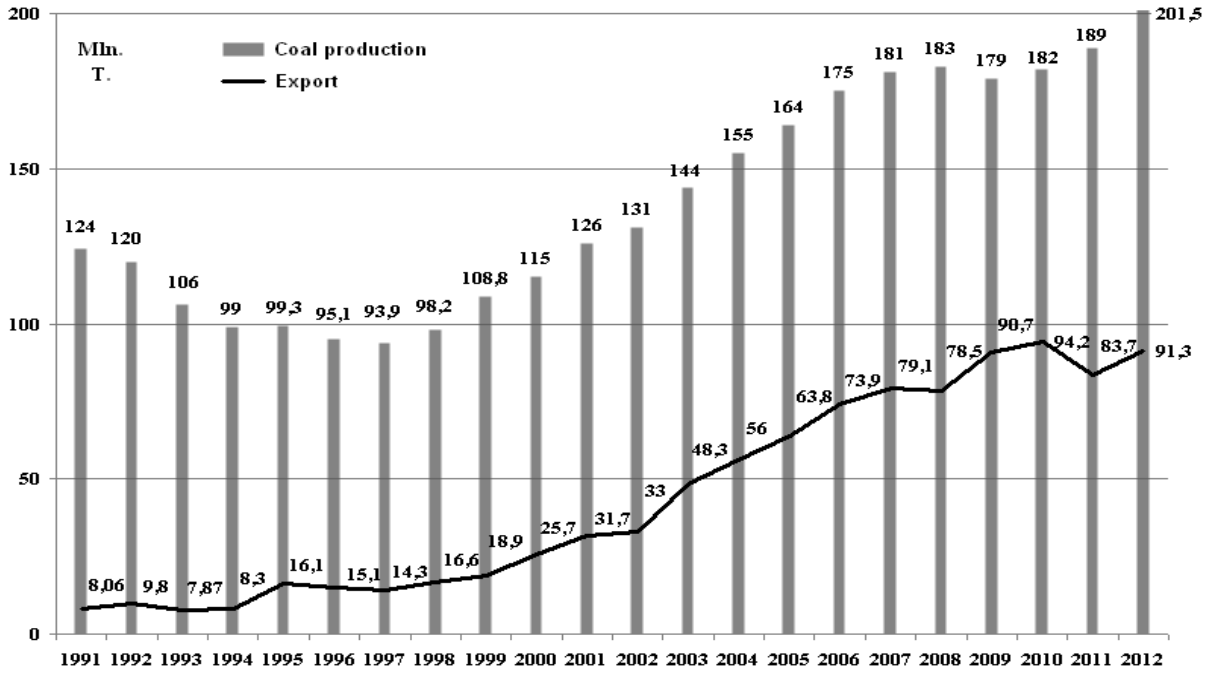
Over the past five years the cost of production per ton of coal in the Kuzbass increased by 2.5 times (2012 – 1411.56 rub/Ton), and the selling price – 2.2 times. So many Kuzbass coal companies have at best zero cost-effectiveness, but do not reduce exports in anticipation of market recovery.

[1] Analytical review "Russian coal market in 2012." RBC. – M., 2012. P. 54.

[2] Records coal production and export in Russia should not be misleading (press release of the Institute of Natural Monopolies, 12.12.2012). – URL: http://www.delkuz.ru/content/view/16580/1/

Kemerovo Region Governor Aman Tuleev – speaking November 20, 2013 with the budget message for 2014 and the planning period 2015–2016 – noted that during 2014 the Kuzbass miners will extract at least 200 million tons of coal. While coal miners will have to make every effort to keep its export position, as exports as a key factor in the growth of the industry. Meanwhile the head of the region drew attention to sell the Kuznetsk coal in world markets, it is necessary to increase value added[1].

First of all, we are talking about the development enrichment facilities. Over the past 10 years 19 enrichment plants and concentrators were put into operation in Kuzbass. As a result, while in 2003 the region was enriched 41.5% of the coal, in 2013 – almost 72%[2].



Source: Kemerovostat and Customs Statistics.

Fig. 1. Dynamic of coal production and coal export from Kuzbass in 1991–2012, mln t.

Over 15 years 507 billion rubles were invested in the Kuzbass coal industry, 74 new high-mining and coal processing were built[3]. The world's best technologies and equipment both in production and in the enrichment are used at new enterprises in the Kemerovo region now. Moreover, in some cases, the original (having no world analogues) enrichment technology is used there today. With rare exceptions, all the profits coal mining companies operating in the Kemerovo region invest in their own development, and "debt / EBITDA" in the best companies is 3–4, and some reaches 9. According to our estimates, $10–12 is invested per one ton of coal mined in Kasbahs now. However, it is necessary to invest more than 2–3 times in order to compete in the first place in the world markets. Still not enough investment – compared to the world level – goes to the environment, security, logistics.

In our opinion, the current model of the coal business, forced to become export-oriented is only a reflection of the situation on the domestic market, and the result of natural processes of integration of Kuzbass into the world economy.

[1] Governor Aman Tuleyev: "Economize on people we do not" 20.11.2013. – URL: http://kemoblast.ru/news/2013/11/20/gubernator-a-g-tuleev-ekonomit-na-lyudyah-my-ne-budem.html

[2] In the same place.

[3] Ivanter A., Popov A. President of the miner Republic // Expert. – 2013. № 46 (876).

It is difficult to explain the phenomenon of export of Kuzbass coal because of the following facts:

- the region is geographically disadvantaged against major world coal markets, at a distance of 4-6 thousand miles to the sea ports that must be overcome by railway (it is 12 times larger than that of its main competitors from Australia and Indonesia);
- much more difficult conditions of coal mining in Kuzbass, no fields that can be developed using cyclic-flow technology;
- high costs of exploration and development of coal deposits due to low quality "pre-licensing" exploratory drilling;
- coal business has little influence on Russian exports (less than 2% of total export) and does not affect beneficial currency rate for coal export;
- low share of foreign capital in Kuzbass coal business. Only two coal companies ("Raspadskaya" and "Kuzbass Fuel Company") conducted IPO over the past five years;
- no system of protection in Russia (tax incentives, soft loans, subsidies to producers, in addressing infrastructure issues[1]);
- labor is becoming more expensive in the region constantly.

All the above factors extenuated by prices in the context of high world prices for coal. But the situation has changed in the markets in non-stop mode now**.** Problems of Kuzbass coal industry are progressively exacerbated because of the reduction of coal cost due to the increase of its supply on the world market.

For example, in the United States cheap shale gas[2] displaces coal which is exported. According to some estimates in 2012 coal exports from the USA to Europe grew by 23% – to 66.4 million tons and almost all addition went to coal generation.

Several new factors – besides shale gas – can affect to world energy markets in the long term of 10–15 years. In the first place, we can note the *discovery of natural gas reserves in Israel and Cyprus*. On the one hand, it's reduce the dependence of these countries on imported fuel, on the other, it's may allow them to become serious by the suppliers of gas to the European market. We recall Israel is quite noticeable consumer of coal – its consumption for electricity production reaches 12–15 million tons per year. Release even half the today level of coal is very significant impact on the markets of high-energy power plant coal.

It is impossible not to note the efforts of Japanese companies for the extraction of methane hydrates (methane compound with water, one of the most common types of gas hydrates). The beginning of their production the industrial scale will be comparable to the "shale gas revolution" in the US.

Coal will firmly hold important place in the fuel balance in most developed countries due to high stocks and relatively low cost production, despite the emergence of new production technologies and new energy sources.

The coal industry has already demonstrated its ability to adapt to restrictions similar to those set by the Kyoto Protocol – combustion technologies are becoming clearer, so the demand for coal is growing faster than alternative fuels in the world in recent years. Coal

[1] In order to promote Russian export there are reducing indexes to railway tariffs for the coal transportation, including system of reducing indexes for transportation of coal for export through Russian ports (Arkhangelsk, Kandalaksha, Murmansk, Vanino, Posiet, Nakhodka, Vostochny) and border-crossings at a distance more than 3500 km. However there are all reasons to believe that this "protectionist" measure will soon be canceled.

[2] The US shale gas production in 2000–2012 increased from 11 billion m3 to 200 billion m^3. As a result the US market originated excess gas, which led to a drop in domestic prices to $450 per 1000 m^3 in the summer of 2008 to $120–130 in early 2013. (What is the "shale revolution" // Kommersant-Vlast. 2013. № 15). As it is projected that by 2040, US shale gas production could rise to 485 billion m^3. According to experts, about 30% of the needs of the US market today covered by shale gas. (Gas for future generations // Kommersant–St.Petersburg. "Energy. Oil. Gas". Application, №79. 14.05.2013).

is the main fuel for electricity generation in the United States, Germany, China, India, South Africa, Australia, most countries in Central Europe. Many experts are sure that coal would be preferable to gas and energy sources exchange in the world market is primarily associated with the new technology of coal combustion, are not detrimental to ecology[1].

World coal production increased by more than 70% during the last ten years and in 2012 amounted to 7.7 billion tons. About 15% of the world's coal is supplied on the global markets today.

Almost half of world coal production (2012)[2] is accounted for by China (3.52 billion tons). The second leading producer of coal is USA (about 1 billion tons). The third leader is India (a little more than 500 million tons).

Regional structure of coal consumption in 2012 is as follows: the Asia-Pacific region – 69.8%, North America –12.6%, Europe and Eurasia – 11.4%, Africa – 2.6%, Russia – 2.5%, Latin America – 0.8%, Middle East – 0.3%[3]. The electricity generation is the most of the coal consumer.

World coal market is sufficiently competitive; many countries are engaged in the coal export. However, the main contribution to the global coal export and the formation of world coal prices makes the five countries, which account for 70–80% of coal export: Australia, Indonesia, Russia, China and South Africa.

The two segments of the world coal market – Asia-Pacific, Europe and Eurasia – are greatest interest for the Kuzbass coal exporters (it's dominant in the supply of Kuzbass, primarily power plant coal). According to Russian experts, shipments of these markets will be equal in the long term till 2030. Kuzbass the share of in Russian export is about 80% today and will remain at the same level 10–15 years in the future.

In this context, Russian (Kuzbass) coal companies have no other way for to reduce their own costs, improve product quality. But without government interference is impossible to create a full-fledged export-oriented model, consequently, there is a danger that the coal industry will reduce its participation in the innovative development of the regional economy and from the driver of growth becomes to "supplier problems".

In fairness, we note that the regional authorities are well aware of the situation, and "Strategy for attracting investment in the Kemerovo region for the period up to 2030" (adop-ted in Jan 2013) provides for measures to 16 destinations – including support for access to foreign markets and export, increasing the availability of energy infrastructure, improvement of customs administration.

THE STRATEGY OF NEW MARKETS DEVELOPMENT

Regional power and a sufficiently large group of experts decide that there are the critical mass conditions and the factors contributing to the success of projects coal-chemical directivity in the Kemerovo region. It means reading to create of new coal market at the moment.

We want to remind that coal deep processing technology can be roughly grouped into three main groups: adaptive technology (to improve of product quality); diversification technology (to create of products with new consumer properties); transforming technology (to create of non-fuel appointment products from coal and waste).

[1] Analytical review "Russian coal market in 2012." RBC. – M., 2012. – P. 16.
[2] BP Statistical Review of World Energy 2013. P. 32.
[3] BP Statistical Review of World Energy 2013. P. 33.

Both Kuzbass coal domestic market supply and its export are connected with only one of the three possible patterns of coal processing today, namely, using the adaptive technologies providing maximum satisfaction of the increasing demands of traditional customers (steam-electric stations, metallurgy, housing and communal services, etc.) by improving the quality parameters of the coal produced. Adaptive technologies improve the coal quality to such extent that it allows coal companies to obtain the maximum margin in the domestic market and to compete in world coal markets.

The second and the third patterns of coal processing, namely, diversification and transforming technologies are used as the technological basis for the organization of large perspective complexes in the Kemerovo region:

- Power Technological Complex "Karakansky" – electric power generation at the small power generation objects, the production of char and termokoks, the production of construction materials from coal refuse, as well as chemical products production (phenol, benzene, cresol);
- Power Technological Complex "Seraphimovsky" – deep processing of coal and the production of motor fuel (up to high-octane gasoline), gases and other chemical products, the production of building materials from coal refuse;
- Power Technological Complex "Mencherepsky" – the creation of a closed technological complex including "the production coal – coal deep processing – the electric power generation", the construction of a coal-chemical plant for the production of methanol, benzene, dimethyl alcohol pitches and synthetic motor fuel, the production of construction materials from coal refuse;
- technological complex with underground coal gasification (in the fields of mine "Long Mountain") – the production of heat and electricity by underground coal gasification in situ and the production of synthetic gas. Some part of the produced synthetic gas will be passed in the process flow to the electrical power station; some part will be used for the production of chemical intermediates (paraffin, ammonia, acetic acid, olefins) and products (gasoline)[1].

The realization of these projects will require considerable resources (cumulative investment for realized the four named projects is estimated at 148.5 billion rubles in the period up to 2020[2]) however main problems are not the financial ones. They are as follows:

- the availability of economically and environmentally acceptable industrial technologies;
- the readiness of business to implement these projects;
- the readiness of the market "to accept" these products.

There is no doubt that "transformative" and "diversification" coal monetization technologies will dominate in the long term. The economic and technological conditions for the creation of coal-chemical complexes for the production of synthetic liquid fuels (SLF) and polymeric materials are likely to be created in the future 30 years. However, the largest coal-mining countries such as China and the US make only the first steps in this direction and develop these technologies within the frames of energy supply and economic security programs.

[1] Program development of innovative territorial cluster "Integrated processing of coal and industrial waste" in the Kemerovo region (summary). – URL: http://cdrom01.economy.gov.ru/Innovations/ Комплексная%20переработка%20угля%20и%20техногенных%20отходов%20в%20Кемеровской%20области/index.html

[2] In the same place.

CONCLUSIONS

In conclusion we remark that some authors are deeply mistaken those who think that the Kuzbass "is aimed at resource-based economy" and can not compete effectively in the global coal markets[1]. Kuzbass coal business is a powerful driver of innovation development in the region – the coal business incomes are invested in the creation of new innovative industries and products; the coal industry itself is the largest consumer innovation in the Kuzbass region.

The Kuzbass model development of the coal industry (was created in the years of 2000–2009) allowed to strengthen role of the region in addressing the Russian economic security and to conquer new markets for coal products. However, there is requirement of new approaches to the development of the coal business and new growth points, new drivers of innovation development now. And very important to accent – known the role of global markets to the regional economy – it is necessary to create a system of institutions that implement this strategy, both at the federal and regional level. And the coal-chemistry direction of the innovative development in regional economy should be seen rather as one of the variants of perspective development of the coal business but not like a panacea.

[1] Urban O.A. Subjects of modernization and innovative development in the Kuzbass // ECO, 2013. № 4; Markova V.M.; Churashov V.N. Will stand whether the russian coal in competition with the world shale gas // ECO, 2013. № 9.