

The status of the Russian coal industry and its prospects in the period to 2030

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The development of coal production in the Russian Federation, 2000–13

Russia is currently the sixth coal producer in the world after China, the USA, India, Indonesia, and Australia. Industrial reserves of Russia's currently operating coal enterprises are around 19 billion tonnes (more than 550 years' production at the current level); this figure includes coking coal reserves of around 4 billion tonnes.

‘RUSSIA IS CURRENTLY THE SIXTH COAL PRODUCER IN THE WORLD.’

In 2013, coal production volumes amounted to 352 million tonnes (representing growth of 36.2 per cent compared to 2000, when 258.5 million tonnes was produced). In 2013, coking coal accounted for 22 per cent of the total and thermal coal for the remainder. The growth of coking coal production in Russia in 2013 compared to 2000 was 29.7 per cent, while for thermal coal it was 38.2 per cent.

Around 70 per cent of coal in Russia (71 per cent in 2013) is produced by opencast mining, with the remaining 30 per cent from subsurface mining. There are 22 coal basins and 129 separate coalfields in operation; most production is in the Kuznetsk Basin, East Siberia, and the Far East.

Development of Russian coal supplies by usage, 2008–13

In 2013 Russian coal supplies amounted to 321.9 million tonnes (The difference between coal production (352 million tonnes in 2013) and supply (321.9 million tonnes in 2013) is losses in processing and transport, and producers' stockpiles.); only 55.6 per cent of this was consumed

domestically, down from 68.1 per cent in 2008. Electric power stations accounted for 27.4 per cent of total Russian coal supplies in 2013 (down 7.6 per cent from 2008). Taking imported coal into account, the volume of coal supplied to power stations in Russia in 2013 came to 117.6 million tonnes (down 9.8 per cent from 2008). The reduction in levels of electricity consumption between 2008 and 2013 led to a fall in the volume of deliveries of coal to Russian power stations.

The trend for domestic coal demand – for both thermal and coking coal – is in long-term decline. The volume of coal supplied for coking in 2013 fell to 40.9 million tonnes (1.4 per cent lower than 2008) due to a general decline in demand for coking coal, brought about by developments in ferrous metallurgy. As of 2008–9, demand for Russian coking coal did not change substantially, remaining at around 37–39 million tonnes per year. There

has been a significant tendency to reduce the specific consumption of coke in metallurgy and to switch to more modern production methods.

‘THE TREND FOR DOMESTIC COAL DEMAND – FOR BOTH THERMAL AND COKING COAL – IS IN LONG-TERM DECLINE.’

In 2013, 27.8 million tonnes of coal (1.8 million tonnes more than in 2008) were supplied for general household needs and the agricultural sector.

The negative dynamic of domestic coal demand is making the Russian coal sector less stable, and is increasing its dependence on external market conditions. The main reason for the fall in domestic coal demand has been competition from gas, the price of which is regulated – although even in conditions where gas prices are deregulated, coal is incapable of competing with gas. Technically it is possible to increase the level of demand

Supplies of Russian coal by type of usage (%)						
	2008	2009	2010	2011	2012	2013
Coal supply – total	100.0	100.0	100.0	100.0	100.0	100.0
of which:						
Coal supplied to Russia (domestic market)	68.1	65.5	67.4	65.0	59.7	55.6
to power stations	35.0	31.5	32.4	31.2	30.7	27.4
for coking*	14.1	14.6	14.4	13.8	12.7	12.7
for general household needs, the agricultural sector	8.7	8.8	8.4	7.8	7.7	8.6
other consumers**	10.3	10.6	12.3	12.2	8.5	6.9
Export – total	31.9	34.5	32.6	35.0	40.3	44.4
to non-CIS countries	28.9	32.4	29.8	32.2	37.2	40.6

* including coal supplies for smelting

** Ministry of Internal Affairs, Ministry of Defence, small-scale industrial boiler facilities, cement and brick works and others



for coal by converting fuel oil or gas-fired boiler plants to run on coal instead. On the other hand, it is entirely possible that coal would be capable of competing with gas, should natural gas prices increase. At present, coal and gas prices on the domestic market are approximately the same. According to our calculations, in order to bring about an economic motivation for power stations to use coal instead of gas, it is necessary for the price ratio of gas to coal to be not less than 2.5:3.0–3.1, expressed in units of fuel content. This would possibly give rise to the basic conditions necessary for more active development of coal-fired power generation.

With the stagnation of domestic coal demand, increasing the supply of coal for export is the main factor driving rising coal production. Coal exports accounted for 44.4 per cent (143.1 million tonnes) of all deliveries of Russian coal in 2013, which is 49.7 per cent more than in 2008. More than nine-tenths of total Russian coal exports (91.5 per cent) went to non-CIS countries. Seventy-four Russian coal companies delivered coal products to the international market in 2013; for half of these, exports accounted for more than half of their total sales of coal. The main consumers of Russian coal in 2013 (accounting for around 75 per cent of all Russian exports) were Cyprus, Great Britain, Ukraine, South Korea, Turkey, Japan, the Netherlands, Switzerland, Poland, and China, among others.

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‘... INCREASING THE SUPPLY OF COAL FOR EXPORT IS THE MAIN FACTOR DRIVING RISING COAL PRODUCTION.’

The Russian Federation’s coal imports in the period 2008 through 2013 grew by 14.7 per cent to 29.6 million tonnes by the end of the period. Of total Russian coal imports, 95.9 per cent came from Kazakhstan and 4.5 per cent from the USA; 93.6 per cent of these imports were thermal coal.

Predicted production and consumption levels of Russian coal to 2030

ERI RAS is continuously monitoring the long-term development of coke and thermal coal production, both by individual companies and at the various locations. As a result, the most likely outlook for the development of coal production by the various companies, at all locations, can be determined with maximum and minimum possible levels of development. The maximum outcome assumes that companies acquire all the necessary licences for mineral resources development, and presupposes successful realization of innovative projects and favourable prices for energy resources on external and domestic markets. The minimum outcome presupposes unfavourable energy price levels, which will have a negative impact on most of the new projects undertaken.

With the aid of simulation models developed by ERI RAS, we have obtained forecasts of the maximum and minimum possible levels of development of coal production across all coal companies and locations. It was established that, given the maximum outcome, Russia could produce annually more than 700 million tonnes of coal in the period to 2030, of which 183 million tonnes would be coking coal. The minimum outcome would mean a reduction in overall annual coal production levels in Russia in the period to 2030 to 295 million tonnes (59.8 million tonnes of coking coal).

Having predicted the maximum and minimum possible outcomes for coal production, it is possible to work out how coal production in the forecast period might develop in any scenario resulting from changes in the Russian economy and energy consumption, by using simulation models.

In accordance with Russia’s new energy strategy for the period to 2035, approved by the Russian federal government, the table on the next

page shows the predicted volumes of production and supply of Russian coal to 2030.

Regardless of the predicted growth of coal production in the Russian Federation in the period to 2030, ERI RAS’s predictions show a possible decline in Russian coal production to 344–349 million tonnes in 2014.

The main reason for declining coal production in Russia is the changing conditions on the global coal market; these changes particularly relate to gas having gained the upper hand in the domestic American market as a result of the ‘shale revolution’, which led to sharp structural shifts in the market: record low prices for gas and the replacement of coal by gas in power generation. While five years ago the USA was a significant coal importer, 2011 saw a fundamental turning point, and in 2012 the output levels of gas and coal generation were more or less equal. Demand for coal in the USA declined, 114 million tonnes of surplus coal were sent for export in 2012, of which 25 million tonnes went to Europe (1 million tonnes of this went to Russia – which had received 1.5 million tonnes in 2011). In all, around 6–7 per cent of total global supplies of coal were redirected. In 2013 deliveries of American coal to EU countries grew to 65 million tonnes (compared to 28.4 million tonnes in 2009), while deliveries to Asia–Pacific increased to 38 million tonnes (compared to 5.8 million tonnes in 2009).

Australia, Indonesia, and Colombia now had spare volumes of coal that had previously been destined for the American market. In addition, the growth rate of the global economy had slowed down and there was clearly no need for such volumes of spare coal. Supply exceeded demand, and slowly but steadily, coal prices began to fall.

Considering the long-term nature of increasing shale gas production in the USA and coal exports to EU countries, many coal-exporting companies,

Predicted volumes of production and supply (in million tonnes) of Russian coal to 2030					
	2013	2020		2030	
		<i>minimum projection</i>	<i>maximum projection</i>	<i>minimum projection</i>	<i>maximum projection</i>
Coal production in Russian Federation	352	392	425	410	460
coke	80	105	112	112	120
thermal	272	287	313	298	340
Supply of coal, total	315	351	383	369	415
To the domestic market, total	175	193	203	199	210
for electricity generation	92	106	110	115	123
for coking	38	40	40	40	40
for household needs, agriculture	23	22	24	19	17
others	22	25	28	25	30
For export, total	140	158	180	170	205
coke	19	23	29	35	40
thermal	121	135	151	135	165

including Russian ones, will, in the near future, experience increased downward pressure resulting from the efforts of coal exporting companies in the USA.

According to ERI RAS's forecast, global production of shale gas could amount to around 700 bcm/year in the period to 2030, with 400–500 bcm from the USA, 70–80 bcm in Europe, and 110–140 bcm from China. In terms of coal equivalent this is quite impressive, and will result in additional energy resources in Europe of 120–130 million tonnes a year, and 190–230 million tonnes a year in China. This will substantially reduce potential European and Chinese coal imports and increase the risk to coal exporters to these regions. The first exports of shale gas to EU countries could happen in 2015.

The additional energy resources that could appear on the global market by 2030, in terms of coal equivalence, amount to 650–800 million tonnes a year. At present, total global coal exports are around 1–1.2 billion tonnes a year. So the expansion of a competitive gas market will, by dint of the inclusion of shale gas in economic turnover, intensify competition in the

global gas market in Europe and Asia and will impinge on the possibilities open to coal exporters.

Account should also be taken of such factors as the advance of energy conservation, and the gradual replacement of coal in the energy mix by renewable energy sources, which are currently underway internationally, including in Russia.

Nonetheless, according to ERI RAS's predictions, it is possible that there will be an increase in Russian coal exports to 150.4–153.5 million tonnes in 2014, depending on coal production volumes.

Main challenges and threats to the development of coal production and export

The Russian coal industry confronts a range of external and domestic factors that lead to reduced consumption of coal, including:

- Increased competition between different types of energy resources on external and domestic markets resulting from a possible fall in oil prices;
- Declining global prices for primary

energy resources (oil, gas, coal), accompanied by a slowdown in growth rates of the global economy;

- The need of many countries to change to an innovative way of developing the fuel and energy sector, including the Russian coal industry;
- Increasing energy conservation and the gradual reduction of coal in the energy balance together with its replacement by renewable energy resources, a process which is already underway in most of the world's developed economies;
- The issue of shale gas, brought about by the intense development of shale hydrocarbons in the USA, which will make itself felt in the development of the coal industry (and in the international coal balance) by 2020–30 including in Russia;
- The anticipated wave of technological changes which will accentuate the role of innovation in social and economic development and the declining influence of many traditional growth factors;
- The exhaustion of the potential for raw material exporting models of economic development based on increased fuel



and raw material exports as well as the production of goods for domestic consumption due to the low costs of factors involved in manufacturing, such as labour costs, fuel, electricity.

Forecast of coal consumption volumes, and measures to stimulate market development

In 2012 global coal demand came to around 7.7 billion tonnes (61.2 per cent higher than the level in 2000). Between 2000 and 2012, coal consumption increased in Asia by 2.4 times, in Latin America by 1.5 times, in former Soviet countries by 25.2 per cent, in Africa by 17.8 per cent, and in Australia and New Zealand by 7.6 per cent. It declined by 16.2 per cent in North America and hardly changed at all in European countries (where there was 0.2 per cent growth). However, in recent years there has been a very slight increase in coal consumption in EU countries (consumption in 2012 was 7.3 per cent higher than the figure for 2009), which can be explained by high gas prices and the changeover to greater use of renewable energy sources that was planned to take place by 2018–20, particularly in Germany. The main gas-consuming countries in the world are: China (whose share in 2012 was 47.6 per cent), the USA (10.7 per cent), India (9.8 per cent), Russia (3.4 per cent), Germany (3.1 per cent),

South Africa (2.4 per cent), Japan (2.4 per cent), Poland (1.8 per cent), Australia (1.8 per cent), Ukraine (1 per cent), and Indonesia (0.8 per cent).

According to ERI RAS's predictions, there may be a reduction in global annual average growth rates in coal demand in the period to 2020. While this growth rate was 5.6 per cent in 1990–2010, it is predicted that it will fall to 1.2 per cent by 2020, with growth rates declining from 10.6 per cent to 2 per cent in China, from 6.3 per cent to 1.9 per cent in India, from 2 per cent to minus 1.5 per cent in Japan, and from 1.1 per cent to 0.2 per cent in Russia.

Despite the combined influence of the factors outlined above, which will serve to make the position of coal exporters more difficult in the global market, the implementation of measures such as those listed below could stimulate the development of both domestic and external markets for Russian coal. Such measures may include:

- Increased labour productivity and reduced production costs in the coal sector;
- Stimulation of the creation, implementation, and dissemination of fundamental innovations in production, deep processing, and coal usage by coal companies;
- Regulation of rail transportation costs so that they do not grow at a higher rate than inflation. Rail costs should also be flexible and not exceed costs for oceangoing freight;
- Improving tax policies (restoring the cancellation of interest rates for credits at Russian banks upon the completion of investment projects);
- Expanding the practice of public/private partnership;
- Implementing aspects of indicative planning in the coal sector;
- Extending existing legislation for the stimulation and support of investment projects in the Far East and in East Siberia which allows for discounts or exemptions from mineral extraction taxes to be provided for the development of new fields;
- Switching over to long-term contracts for coal supplies for electricity generation, the public and utilities sector, and the metallurgical industries;
- Increasing the quality of coal supplied and reducing transportation costs;
- Stimulating the creation of domestic machine tool manufacturing, which will serve to reduce ongoing manufacturing costs;
- Establishing coal/generating hubs.

