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MONTHLY MAGAZINE, THAT DEALS WITH SCIENTIFIC,  
TECHNICAL, INDUSTRIAL AND ECONOMIC TOPICS

# УГОЛЬ

Ministry of Energy  
of Russian Federation

**SPECIAL**

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**SPECIAL RUSSIAN UGOL (COAL) MAGAZINE  
FOR WORLD MINING CONGRESS**



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# UGOL

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# UGOL

RUSSIAN COAL MAGAZINE

Established in 1925

Published by Russia's Ministry of Energy, UGOL ("COAL") is monthly magazine, that deals with scientific, technical, industrial and economic topics



RUSSIAN COAL MAGAZINE



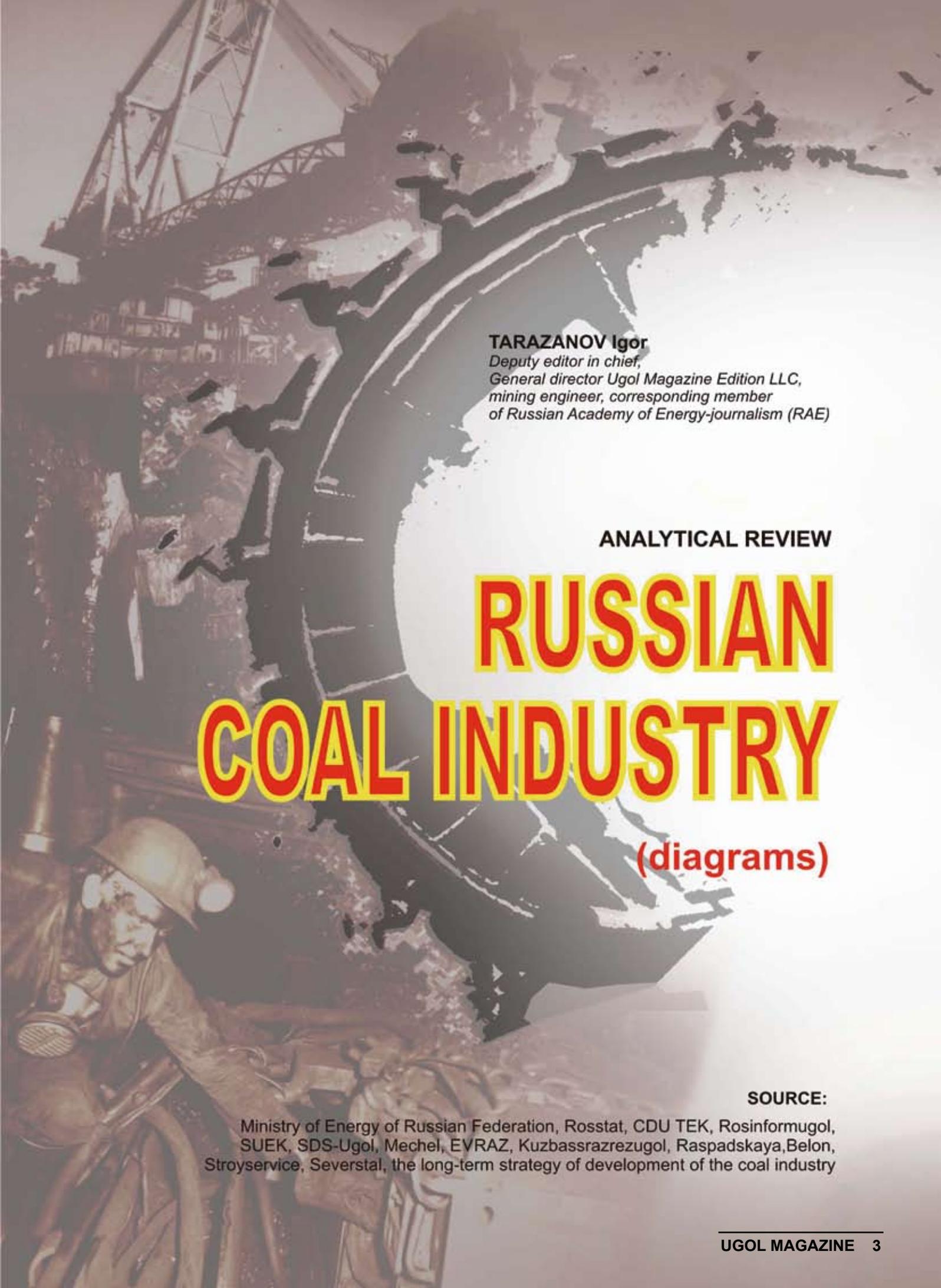
UGOL Magazine Edition  
Leninsky Prospekt, 6, build.3, off. G-136  
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phone/fax: +7(499) 230 2550  
e-mail: ugol1925@mail.ru

UGOL is the leading magazine of Russia's Coal Mining Industry. The main subscribers are Russia's coal mining enterprises (coal companies, underground and surface mines, machine manufacturers, research establishments and others). Apart from Russia the magazine is also distributed to foreign subscribers in 15 countries and the CIS.

The magazine publishes industrial and social issues of coal mining companies. Furthermore, it provides economic information, statistical data, outlooks, regional reports, news about progress in mining technologies and equipment, underground and surface mining, coal processing and utilization, articles on environmental issues, miners' safety and health. Also included are experiences in other countries, short news items, mining exhibition and congress reports, official documents, notes on history of mining.

Volume – 72-88 pages and cover, size A4, art paper.  
Circulation – 3 800 – 4 100 copies.

[www.ugolinfo.ru](http://www.ugolinfo.ru)



**TARAZANOV Igor**

*Deputy editor in chief,  
General director Ugol Magazine Edition LLC,  
mining engineer, corresponding member  
of Russian Academy of Energy-journalism (RAE)*

**ANALYTICAL REVIEW**

# **RUSSIAN COAL INDUSTRY**

**(diagrams)**

**SOURCE:**

Ministry of Energy of Russian Federation, Rosstat, CDU TEK, Rosinformugol, SUEK, SDS-Ugol, Mechel, EVRAZ, Kuzbassrazrezugol, Rospadskaya, Belon, Stroysservice, Severstal, the long-term strategy of development of the coal industry



Presently Russian coal mining is a market segment of the Russian economy, with practically 100% of the private companies.

During 1994 – 2007 the industry passed through a difficult period of restructuring and transformed from the one making planned losses to the effective sector of fuel and power sector of the market economy, having achieved the first positive results in providing the country with coal stably.

During the last decade great changes occurred in the working conditions of the coal producers. Most of the assets were acquired by financial groups, steel producers, coal and power holdings.

Russia has anticipated reserves about 4 trillion tons, which makes about 30% of the total world reserves, and this is more than in any other country.

Mineable reserves, with exploration categories A+B+C1 make more than 190 billion tons, those provisionally estimated to category C2 make 79 billion tons.

Russian coal is used practically in all parts of Russia, and is produced in 26 regions. The main mining regions are West and East Siberia. Kuzbass, the leading coal basin of the country gets priority development, Kansk-Achinsk basin has a high development potential.

In 2010 coal was produced at 137 opencast mines and 91 underground mines with the total annual outputs of 380 million tons. Coal is processed at 49 preparation factories and 2 preparation plants with the total capacities above 170 million tons.

The average monthly production of a face worker was more than 200 tons in 2010 (115% to 2009).

Coal production in 2010 made 323 million tons, which is 20.4 million tons (+7%) higher than in 2009 and 6 million tons (-2%) lower than in the most successful for coal industry 2008 (329 million tons). Steam coal outputs made 257.9 million tons, coking coal outputs were 65.1 million tons. Opencast production made 220.9 million tons, underground production made 102.1 million tons.

2011 coal production is forecasted at 350 million tons. In the first half of 2011 outputs made more than 159.7 million tons.

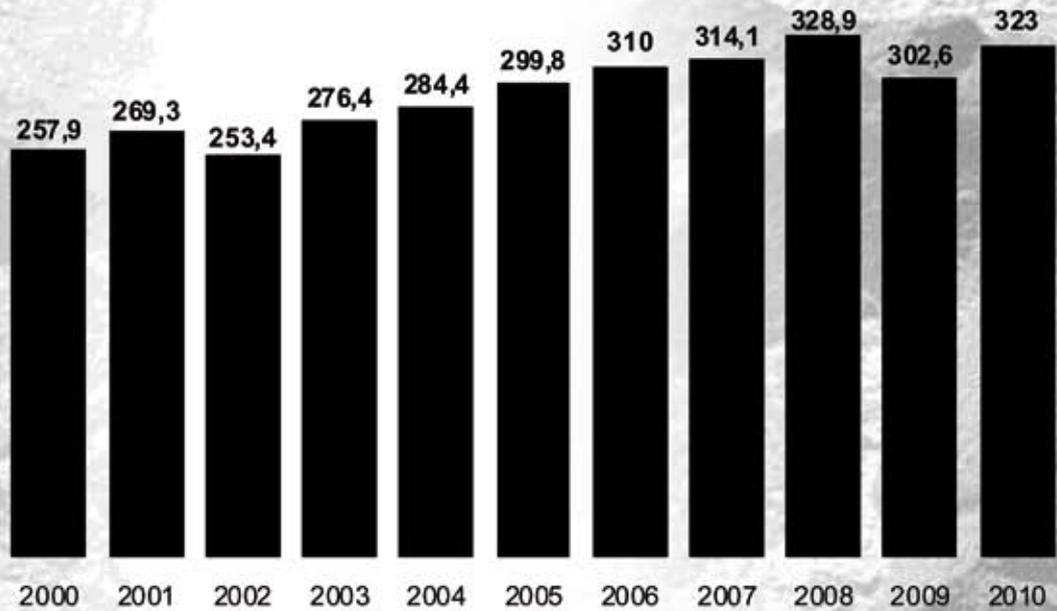
In 2010 115.3 million tons of Russian coal were exported (+7.9 million tons, or +7% to 2009). 17.2 million tons (116% growth) were exported to adjacent countries. The greater part of the exportation is shipped to a few importing countries, such as Ukraine, UK, Turkey, China, Japan, Netherlands, Poland and South Korea (their share makes 70% of the country's export).

Last year export to China saw high growth, reaching 10.8 million tons.

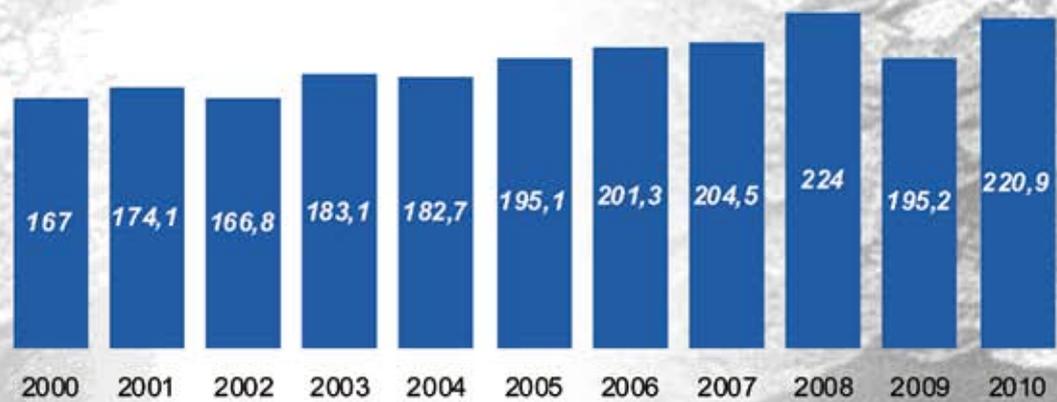
In the first half of 2011 Russia has already exported 57.3 million tons.

# RUSSIAN COAL PRODUCTION DYNAMICS

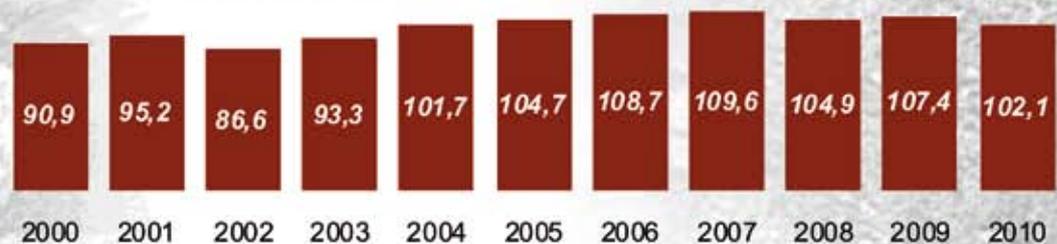
**TOTAL, million tons**



**SURFACE MINING, million tons**

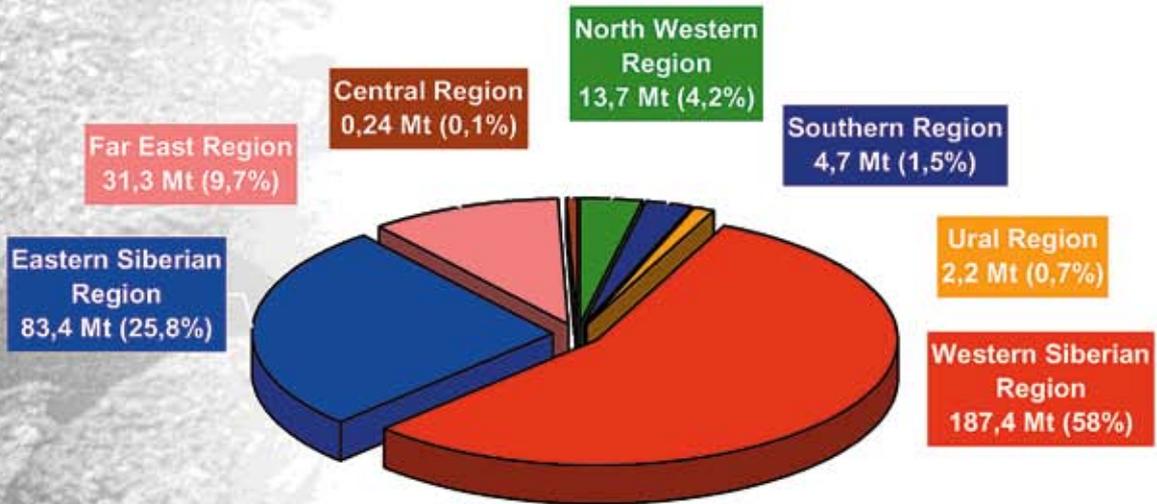


**UNDERGROUND MINING, million tons**

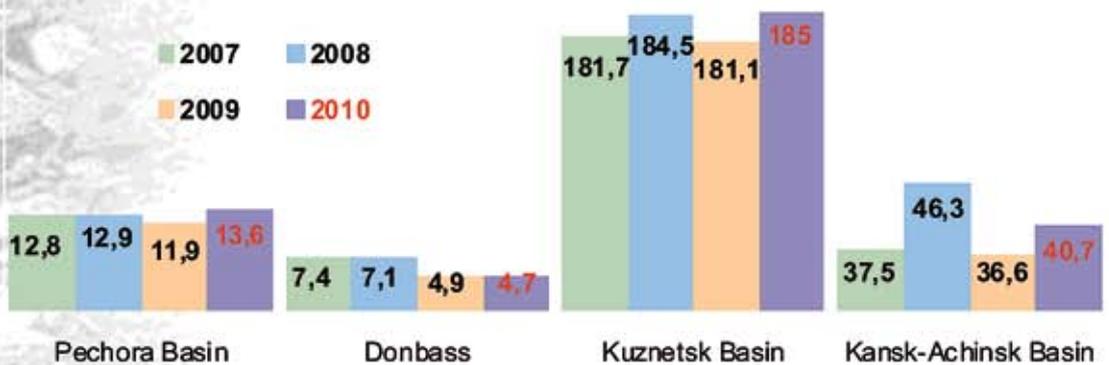


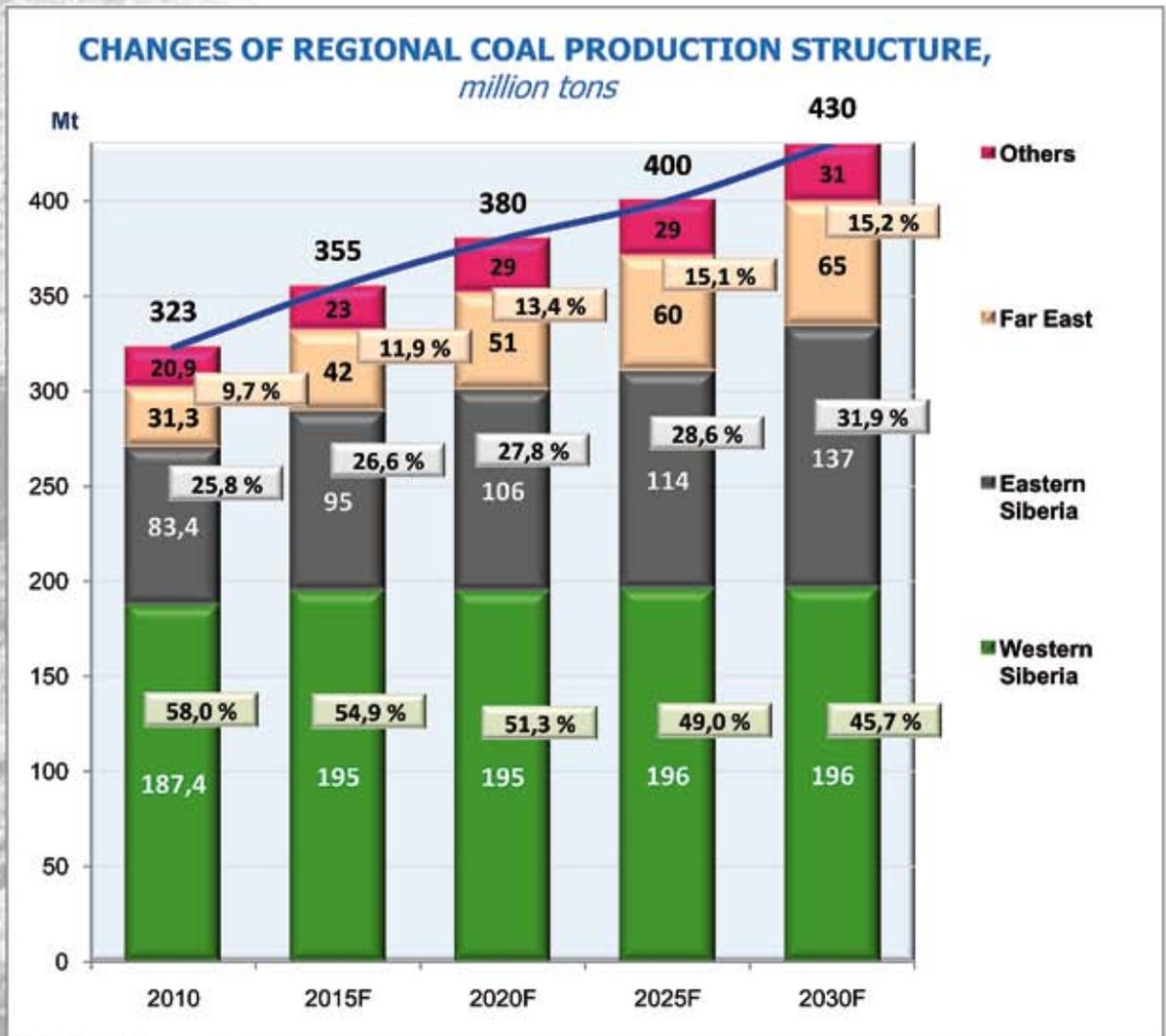
## COAL PRODUCTION BY THE BASIC ECONOMIC REGIONS OF RUSSIA IN 2010

Total - 323 million tons



## COAL PRODUCTION BY THE BASIC COAL MINING REGIONS OF RUSSIA IN 2007-2010, million tons





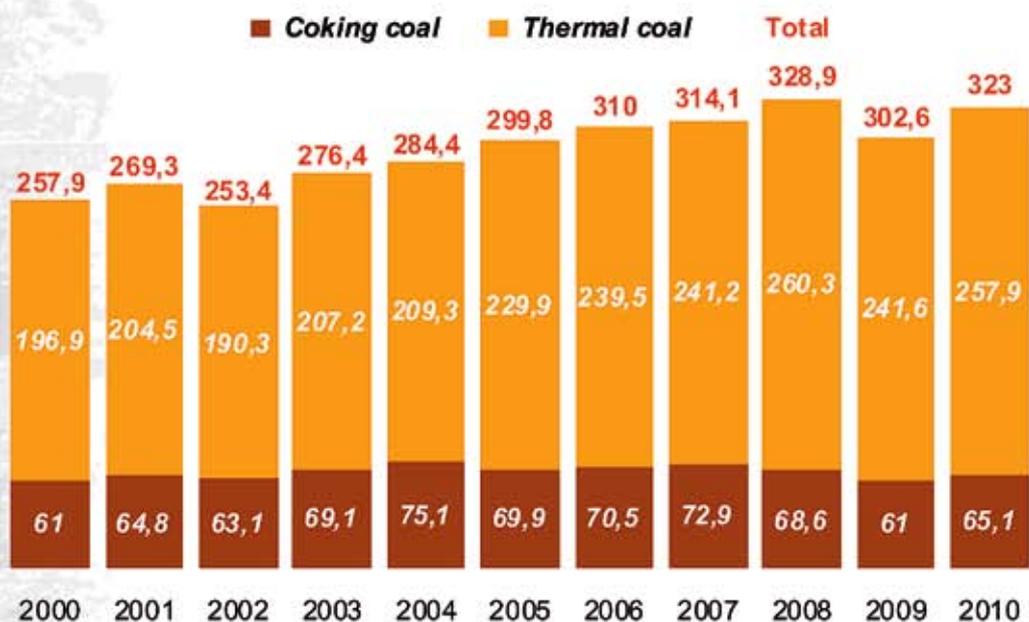
### RUSSIA'S MAJOR COAL PRODUCERS IN 2010, *thousand tons*





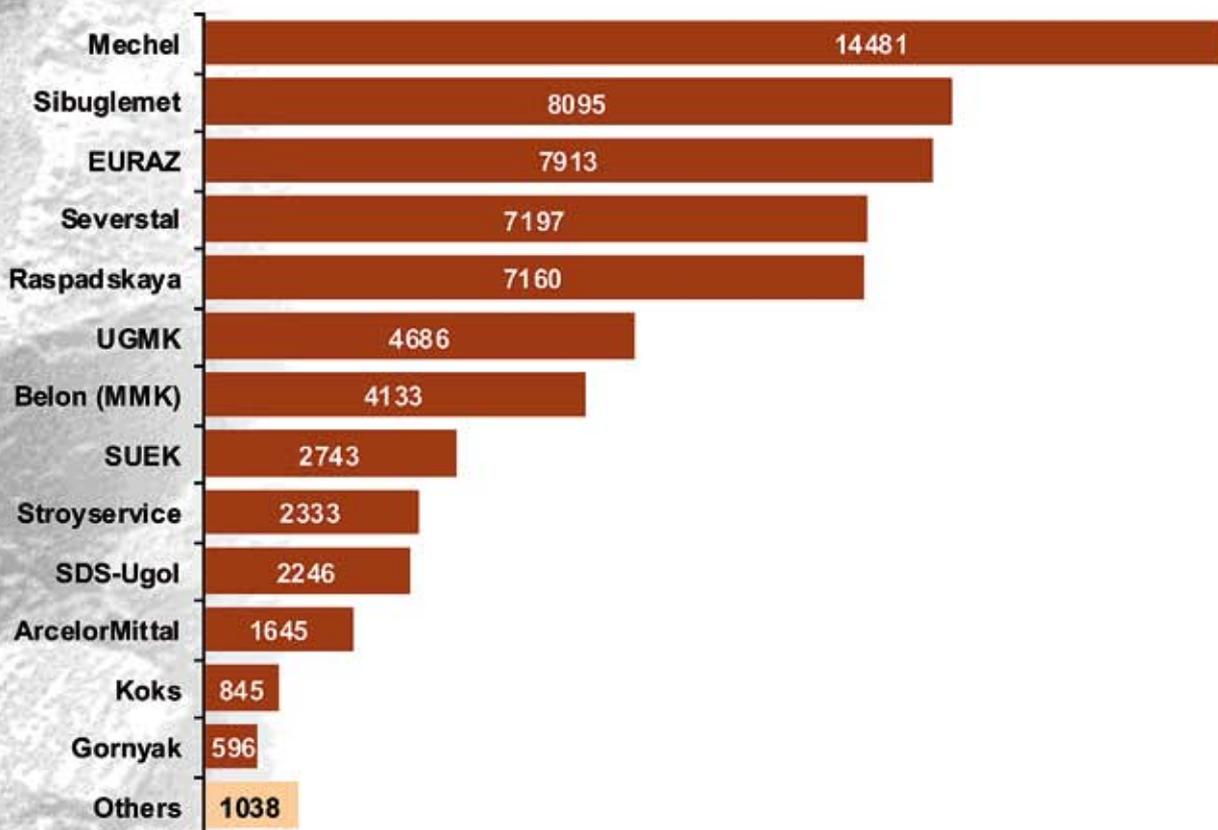
Coalmine of the name of Kirov (SUEK-Kuzbass)

## RUSSIAN COAL PRODUCTION DYNAMICS, *million tons*

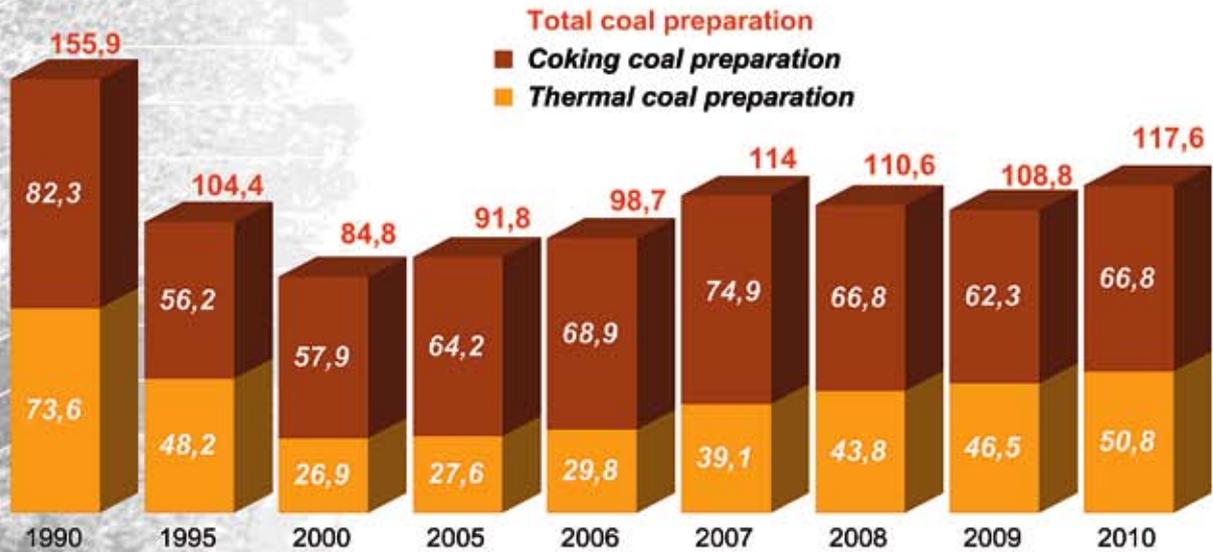


## RUSSIA'S MAJOR COKING COAL PRODUCERS *(coking coal production in 2010, thousand tons)*

*Total - 65111 thousand tons*



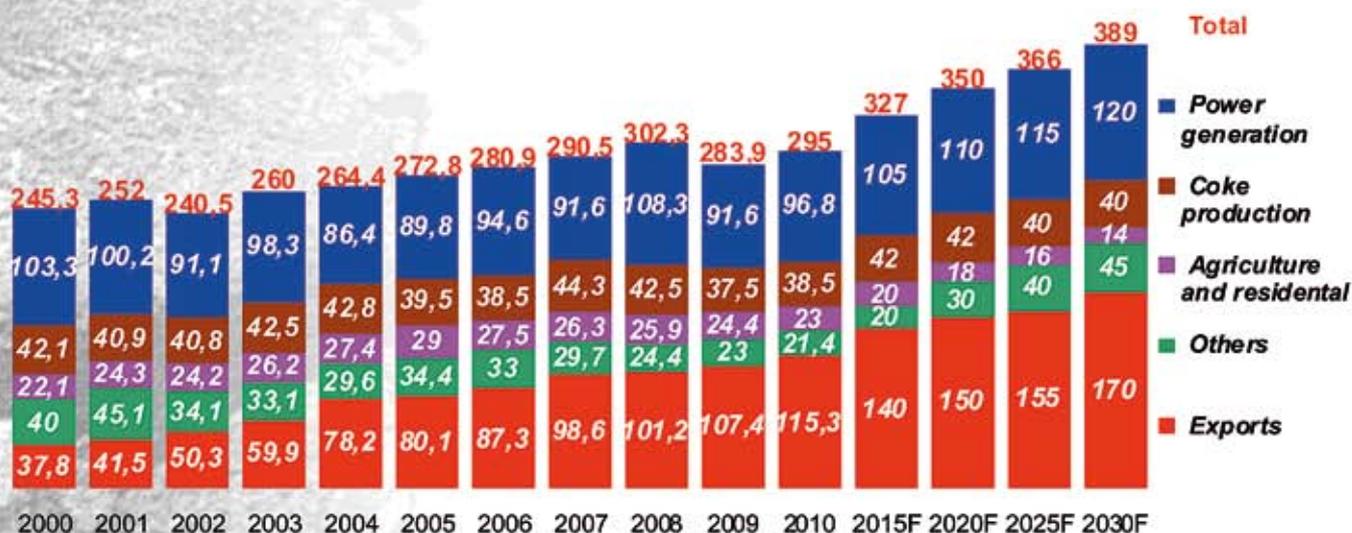
## RUSSIAN COAL PREPARATION OF THE CONCENTRATING PLANTS DYNAMICS, *million tons*



Concentrating plants of Kemerovo Region  
 - *Listvyazhnaya*  
 - *Bachatskay-Koksovaya*  
 - *Mezhdurechenskaya*



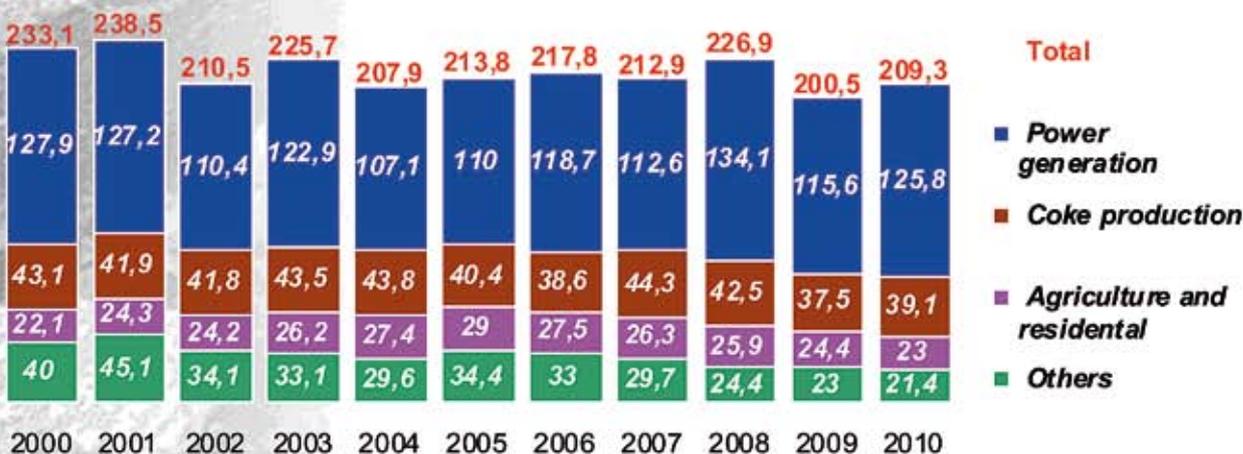
## RUSSIAN COAL PRODUCTION IN RUSSIAN DOMESTIC AND INTERNATIONAL COAL MARKETS IN 2000 – 2010 AND FORECAST, million tons



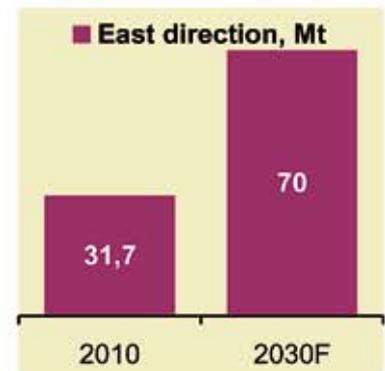
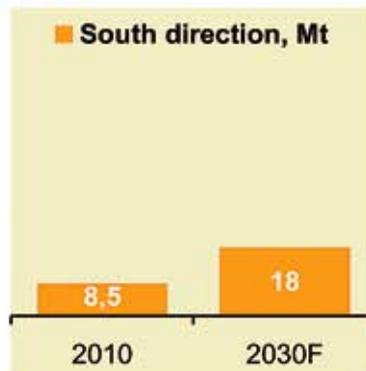
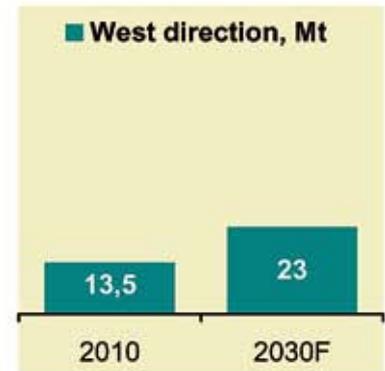
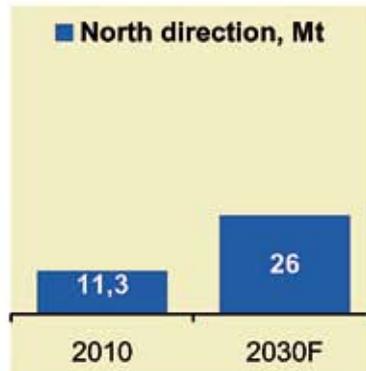
## COAL PRODUCTION IN RUSSIAN DOMESTIC COAL MARKETS OF FEDERAL REGIONS OF RUSSIA IN 2010, million tons



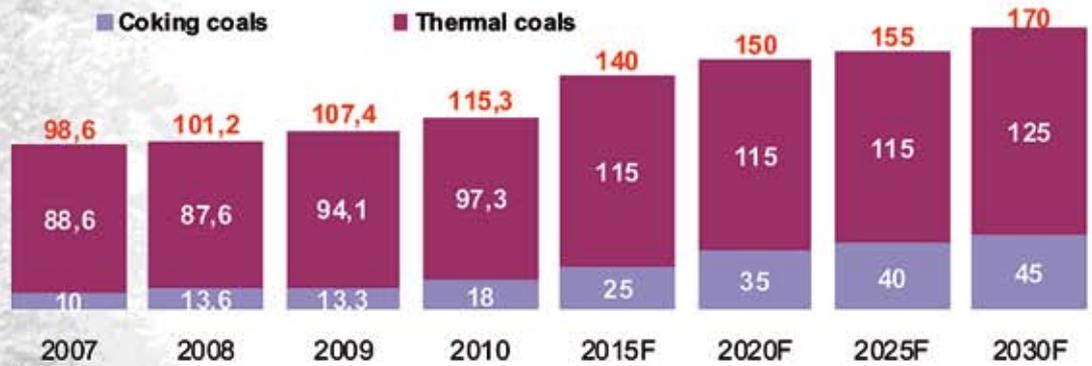
## COAL PRODUCTION IN RUSSIAN DOMESTIC COAL MARKET INTO ACCOUNT THE IMPORT OF COAL, million tons



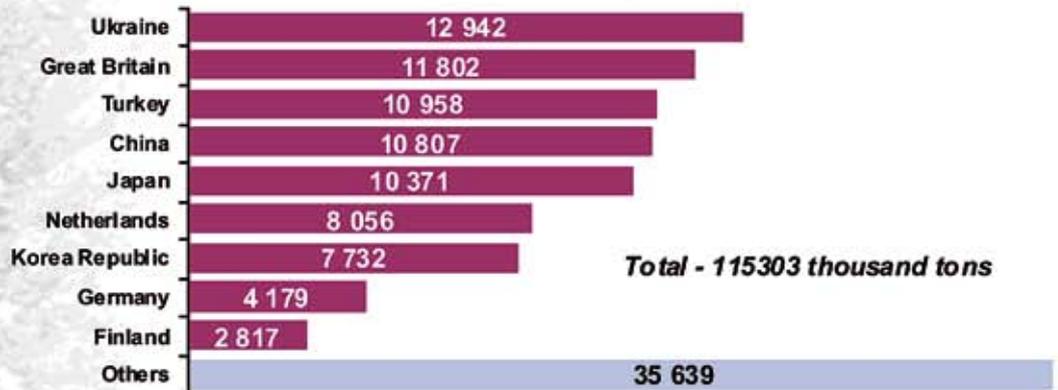
## RUSSIAN PORTS DEVELOPMENT IN 2008 – 2010 AND FORECAST, *million tons*



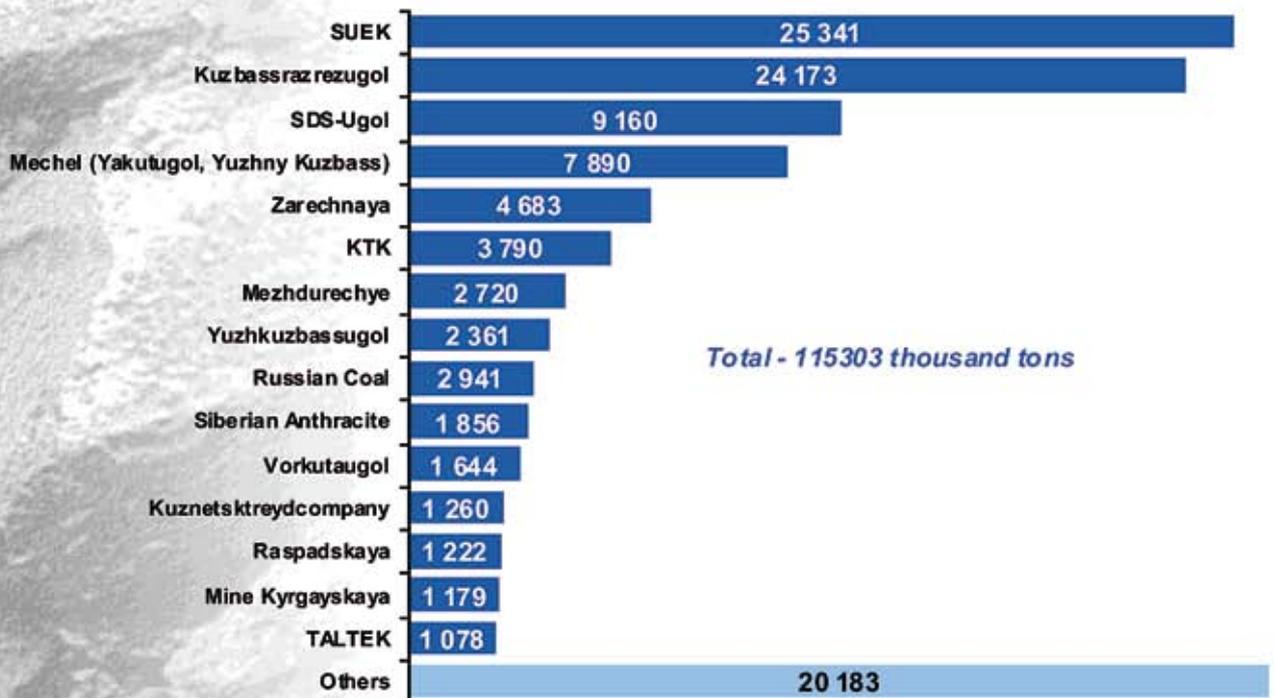
## RUSSIAN COAL EXPORT DYNAMICS IN 2007 – 2010 AND FORECAST, million tons



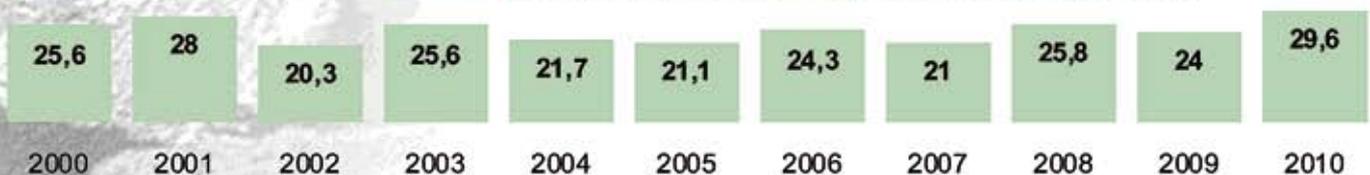
## MAJOR COUNTRIES - IMPORTERS OF RUSSIAN COAL IN 2010, thousand tons



## RUSSIA'S MAJOR COAL EXPORTERS IN 2010, thousand tons



## COAL IMPORT IN RUSSIA DYNAMICS, million tons



## **Commitment to excellence**

**Yurmash is one of the major machine building enterprises in Russia. For almost 70 years the plant has been operating as a powerful multi-divisional structure ranging from foundry and steel melting to assembly of complicated machinery of next generation.**

Mining equipment has been manufactured since 1992 and this activity is given the highest priority. Today Yurmash is an engineering center for coal mining in Kuzbass and a major manufacturer and supplier of coal mining equipment in Russia. The company manufactures a complete range of mainly in-house design machinery and equipment for longwall mining:

- Roof support designed for operating in seam heights of 0,8 - 5,5 m, with a support resistance of up to 1400 kN/m<sup>2</sup>, unit installation spacing within 1,5 - 1,75 m and advance increment 0,63 m and 1 m;
- Different modifications of armoured face conveyors with a line pan width of 0,63 - 1 m for operating in longwall of up to 300 m;
- Longwall shearers K500YU with a rated capacity of 605 kW;
- Roadheaders KPYU-50 with a rated capacity of 270 kW;
- Face-end supports, mine roadway roof support sections;
- Crushers with a driven rated capacity of up to 300 kW;
- A variety of stage loaders with a line pan width of 0,7 to 1,1 m.

Our machinery bearing the mark «YURGA» efficiently works in mines and open pits over Russia and CIS countries. Manufacturing of mining equipment meeting the requirements of international standards is possible thanks to the highly qualified staff, efficient project solutions as well as modern technologies used in production. The company carries out the improvement and modernization programme, and installs unique high-precision machinery equipment of the international leaders. The company's quality control department performs the required testing by means of advanced gauges, measuring units and devices to achieve and approve compliance with various product requirements and customer's needs.

Equipment made by Yurginsky machine engineering plant provides a combination of high performance, high efficiency and quality and was awarded medals and diplomas many times at the international exhibitions and fairs in Russia and abroad. In 2008 the company simultaneously established an integrated management system to the requirements of such three international standards as ISO 9001 (quality management system), ISO 14001 (environmental management system), OHSAS 18001 (health and safety management system).

The company acts as a Prime Contractor performing a complete range of works to deliver, assemble and install mining systems and accepts full responsibility for their operation.

# Quality of our products is a source of your success!

- roadheaders
- longwall shearers
- roof supports
- conveyors
- stage loaders
- crushers
- chain cable handlers



[www.yumz.ru](http://www.yumz.ru)



Stage loader  
PSNR800



Roof support  
MKU.2SH-13/27



Longwall shearer  
K500YU

More detailed information on Yurginsky machine engineering plant is given at [www.yumz.ru](http://www.yumz.ru)  
LLC "Yurginsky machine engineering plant"  
Ul. Shosseynaya 3, Yurga, 652050, Kemerovo oblast, Russia  
tel./fax: (384-51) 7-44-99; tel.: (384-51) 7-41-15  
e-mail: [yumz@yumz.ru](mailto:yumz@yumz.ru)

# Information system development for the development forecasting of the raw-material base of coal industry

UDC 553.04:622.33(470) © V.Y. Afanasiev, V.Yu. Linnik, 2011

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*Candidate techn. sciences, docent  
(State University of management, Moscow)*

According to the Energy Strategy of Russia Coal for the period till 2030 coal production will increase and coal will considerably replace the share of natural gas in electricity and heat of generation. Besides, gas export escalating from Russia to other countries is one of the most effective tools of foreign policy of our country. Gas demand European countries will steadily increase next decade and it will be Russia's task to meet this demand appreciably. Thus, substitution of natural gas by increasing coal share in power generation is a strategic problem of not only domestic, but also foreign policy of Russia.

In connection with the above-stated the analysis of mining and geological conditions of coal seams winning at the operating and perspective mines as well as the estimation of coal seam qualitative characteristics. Data of 207 operating and 220 perspective coal seams has been analyzed.

The analysis of mining and geological conditions of coal seams winning has allowed to develop classifications and typifications of the coal seams, which on the one hand characterize the degree of their suitability to the effective development, and on the other hand it characterizes peculiarities of seam geological structure, their collapsibility and physicommechanical character of coal containing rocks with reference to selection of winning and hading equipment. The developed typifications have been connected into the uniform classification matrix where each element corresponds to the certain group on structure and on category of seam collapsibility and also can be accepted as a complex classification indicator.

Analysis results of mining and geological conditions of coal seam deposits have provided the basis for typification of coal seams on degree of their suitability to effective development. According to the typification the seams are conditionally divided into hi-tech (profitability of 16-30%), technological (profitability of 5-15%) and non-technological (profitability less than 5% or equal to zero).

Indicators of seam ash content, coal moisture content, sulfur content, volatile matter and gross calorific value are estimated for the analysis of qualitative characteristics of coal seams. Summary data about all above-stated seams which are developed by deep mining has allowed giving the generalized qualitative characteristics of various coal marks on the basic coal basins of Russia.

The results of the executed researches lay in the root of the information system for forecasting of raw-material base development of coal industry. The system gives the chance for coal mining predictive assessment for the set term, and also allows stating perspective estimation on mines adaptability level on typical conditions. Only data of those mines which for the period specified by the user were operating is considered at forecasting. The list of operating mines is

formed from the list of not taken out of service mines for the year which was set by the user and from the list of perspective mines which are planned to input in the set year.

The full list of the forecasting estimates is the following:

- The production forecast in the whole and in breakdown on coal marks of the whole branch and of separate regions for the specified year;
- The forecast on mines adaptability level of the whole branch and on separate regions;
- The forecast on typical conditions of the branch;
- The forecast on typical conditions of the regions.

The information system consists of two basic modules – the module of information input and editing and the module of forecasts delivery. All information is stored in a database under the control of SUBD MS SQL Server 2008. The module of input and information editing represents the interface to the database, allowing the user to fill the base with the actual information and to edit the data. The information which is entered into the base is divided into three basic groups – the data from operating mines, the data from perspective mines and directories. The information about mountain-geological conditions of development, deposit, qualitative characteristics of coal seams and also daily average coal mining volume is stored only for operating and perspective mines. Directories contain descriptions of fragile and plastic coal properties, lithotypes, structures of firm inclusions and roof types.

The typical group of structure complexity and a collapsibility category of a seam are automatically defined at the information input into the database about separate coal seam. The calculation of the given indicator isn't carried out in a case of data lack, but possibility of the subsequent editing of the data about a seam for the purpose of information addition to a minimum which is necessary at calculation of typical conditions remains.

The forecasting module allows to receive the report on coal mining, mines adaptability level, typical conditions for the period which was set by the user. Besides, the list of operating and perspective mines is edited in the given module. Editing consists of the mines exception out of the operating list and imitation of perspective mines putting into operation. Thus, the mine is marked in a database as operating or not operating.

All further forecasts are based on the basis of mines lists which were operated in the set year. All unpromising mines which were closed till the specified year and perspective, placed into operation after year on which the forecast is under construction, are excluded from the list at calculation. The forecast is given to the user in a tabular kind or in the graph form.

# SAFETY





**OSIPOV Vladimir**  
*Counsel to General Director  
 of "Production Association "Electrotochpribor" JSC*



## Siberian instrument builders – to the miners

**Annotation:** The article presents the activities of Omsk manufacturer of low-explosive instrumental equipment for mining branches.

**Key words:** equipment, labor safety, lighters, gas analyzers, electric detonators.

**Http:** //www.led.etpribor.ru

Providing the mining branches with high quality equipment is an enough complicated task available for the enterprises of high qualification. In its forty-five-year history in this market segment "Production Association "Electrotochpribor" JSC from Siberian Omsk had proved its high position many times.

Range of products for extractive production is rather wide. First item to mention is the individual headlight, standard or assembled with methane sensors giving signals of gas environment condition at the miner's work area of methane-dangerous excavations. For the period of these articles' production they have gone the way from refilled batteries to modern Li-Pol elements and LED lamps; all that has allowed decreasing the mass and size parameters of lighter about 4 times. Now the enterprise has its own automated manufacture of thermo-catalytic sensors, popular among miners of Russia, Ukraine and Kazakhstan.

Recently on purpose of increasing labor safety the sensors are widely equipped with means of wireless positioning and noticing as well as active radio beacons switched on in emergency case.

Also the portable gas analyzers and methane meters for installation on mining machines are produced. Gas analyzers of recent generation allow controlling three kinds of gas at once, noticing the excessive concentration of any gas against the set level, storing in memory the data of measurements within 48 hours of work. Small size and weight, broad display and possibility to transfer the data to PC via wireless connection make the instrument convenient for control services.

Instruments for controlling the explosion contingencies and electric triggering them produced by our enterprise allow working with electric detonators of different initiation charge in various conditions, including drowned excavations. This allows applying them while extracting minerals and at penetration. The instruments are usable with single detonators and for mass explosion.

New direction of enterprise activity is the production of LED lights to be applied at mechanic linings, mining machines and lighting the drifts and areas. Long-term experience in development of low-explosive equipment and electronic devices has allowed us to make the lighters maximum corresponding to the requirements prescribed.

The enterprise is constantly co-operating with leading research and testing centers of Russia and Ukraine. All mining articles are produced regarding the standards of IEC 60079. All this in amalgamation ensures the advanced level of manufactured products, worthily respected in Russia and abroad.



*Small-scale detonator*



*Methane sensor with small battery,  
 PB version*



*lighter for mines and excavations,  
 PB version, 5 lighters*

# Mine Anemometer APR-2m

Provides air current parametrization in mines and pits in 3 modes-manual, automatic and remote. In all three states the anemometer provides depression survey and automatic monitoring of a ventilation system in full measure.

## Anemometer's APR-2m Advantages

- Indication presence of measurement time duration, speed indications, pressure and temperatures air stream on the display.
- Interface and special computer programs allow to print of the executed measurement with number, date and time of their achievement
- Speed sensor and which a telescopic boom are put away in non-working condition into the device case provides its reliable protection. Speed sensor can be replaced personally by the user if necessary.

You will know everything about air current!!!



## Technical characteristics

Measuring range:	
- Speed, m/s	0.1 – 50.0
- Pressure	8500 – 11700
- Temperature, °C	from -20 till +70
Power supply source	Type A316
Duration of continuous running without battery change, not less, hours	1200
Protection level of external environment impact	IP 54
Explosion proof level and type	PO ExiaI X
Operating live, not less, year	8
Overall dimension, mm	310 x 70 x 55
Mass, kg	0.52

## Developer and manufacturer: EkoTeh LLC

Phone/Fax +7(495) 558-82-08. Phone: +7(905) 736-86-52. E-mail: [m\\_aa37@mail.ru](mailto:m_aa37@mail.ru)

[www.anemometr-apr2m.ru](http://www.anemometr-apr2m.ru)



At the meeting in June 2011 in Novokuznetsk (Kemerovo Region), the exhibition "Ugol Rosii and Mining" mine Anemometer APR-2m was awarded a diploma as the best exhibit, as presented on the stand Anemometer directly from the show was sold to the mine "Raspadskaya".



## Research Center VostNII and Mining Center of labor protection present



### Suspended material concentration control device PKA-01

The device can be used for soaring dust mass concentration measurement of any origin in all industries. Measurements modes are chosen in depend of dust kind.

#### Specification

Indication range ..... 0 – 5000 mg/m<sup>3</sup>  
 Measurement range ..... 2 – 1000 mg/m<sup>3</sup>  
 Measurement uncertainty range ..... 20%  
 Maximum time measurement ..... 3 minutes  
 Mass ..... 950 gr.  
 Outline dimension - 150 x 100 x 250 mm



### Mines dust-explosion proofness control device PKP

The device is intended for a rock dusting mining quality estimation in which rock dusting by polvere inerte is provided. Measurement procedure includes coal dust sampling and the subsequent maintenance definition of the inert dust quantity in the test.

#### Specification

Explosion proof device labeling ..... POExial  
 Protection level ..... IP54  
 Temperature ..... from 0 till 40°C  
 Inert dust content measurement range ..... 1-100%  
 Measurement uncertainty ..... not more than 10%  
 Inert dust content permission ..... 1%  
 Mass ..... 600 gr.



### Stationary dust content measuring device IZST-01

The device is intended for dust mass concentration measurement at maximum excess permissible concentration in the atmosphere control. It is also intended for conditioning system technological control, ventilating systems and air cleanliness.

#### Specification

Dust concentration measurement range ..... 0 – 1500 mg/m<sup>3</sup>  
 Ambient temperature range ..... from +5 till +35°C  
 Relative humidity range ..... from 20 till 98%  
 Barometric absolute pressure range ..... from 84 till 106.7 kPa  
 Dust powder ..... from 0.5 till 150  
 Mass ..... 1500 gr.



## Research Center VostNII and Mining Center of labor protection present

### SKPDS Decontamination net parameters inspection system

The system is intended for stream speed measurement, a methane volume ration, temperature and aeromethane mix absolute pressure. By measured data results and pipeline set parameters (nominal inside diameter) aeromethane mix expense, led to normal conditions is calculated (absolute pressure P=760 millimeter of mercury, temperature T=20°C).



### Mine Anemometer AR-P

AR-P is intended for air stream speed measurement in mines, at conditioning system technological control, ventilating systems and different function objects.

#### Specification

Explosion proof device labeling .....	POExial
Exposure Protection level .....	IP54
Power source .....	accumulator Li-Ion
Working time without recharge .....	6 hours
Environment working temperature range .....	from +2 till +35°C
Charger Voltage maximum .....	5V
Air stream speed measurement range .....	0.1 - 30 m/sec.
Indication range .....	0-50 m/sec.
Admissible absolute uncertainty range .....	(0.1 +0.05V) m/sec.
Outline dimension .....	230 x 120 x 75 mm
Mass .....	not more than 1000 gr.
Warranty assurance .....	12 month

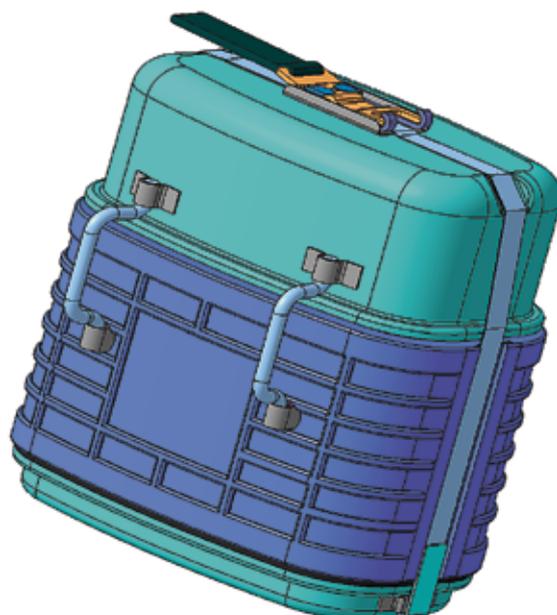


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# Segregative mine self-rescuer of small size with chemical with chemical bound oxygen ShSM-T

**ShSM-T** is intended for respiratory organs protection and eyes at staff evacuation from a dangerous zone with unsuitable breath atmosphere and for primary actions carrying out on emergency expansion prevention at mines, coal producer and other enterprises. Weight reduction till 1,6 kg, in comparison with existing analogs, will provide possibility of constant carrying at regular work performance.

**ShSM-T** provides respiratory organs protection in the atmosphere which contains: CO up to 10 %, SO<sub>2</sub> up to 2%, NO<sub>2</sub> up to 1%, H<sub>2</sub>S up to 1%, CO<sub>2</sub> up to 15%, N<sub>2</sub> up to 100%, CH<sub>4</sub> up to 100%, O<sub>2</sub> from 0% and black and stone dust up to 10 g/m<sup>3</sup>.



Specification	
Defensive action time at using, min., no less then:	
- medium severity (lung ventilation 35 dm <sup>3</sup> /min)	30
- heavy (lung ventilation 70 dm <sup>3</sup> /min)	10
- at rest (lung ventilation 10 dm <sup>3</sup> / min)	120
Exploitation temperature range, °C	from – 20 till + 40
Temperature of inhaled breathing gas, °C, no less then	50
Breath resistance (35 dm <sup>3</sup> /min), no less then	80
Outline dimension, mm H <sub>2</sub> O	170 x 165 x 93
Self-rescuer mass, kg	1,6
Exploitation warranty period, years	till 7,5

**ShSM-T** is supplied with the tightness indicator which allows to carry out tightness visual control according display element color instead of instrument control.

# Segregative mine self-rescuer with chemical with chemical bound oxygen ShS-90

**ShS-90** is intended for respiratory organs protection and eyes at staff evacuation from a dangerous zone with unsuitable breath atmosphere and for primary actions carrying out on emergency expansion prevention at mines, coal producer and other enterprises.

**ShS-90** provides respiratory organs protection in the atmosphere which contains: CO up to 10%, SO<sub>2</sub> up to 2%, NO<sub>2</sub> up to 1%, H<sub>2</sub>S up to 1%, CO<sub>2</sub> up to 15%, N<sub>2</sub> up to 100%, CH<sub>4</sub> up to 100%, O<sub>2</sub> from 0% and black and stone dust up to 10 g/m<sup>3</sup>.



*Self-rescuer at carrying and using*

Specification	
Defensive action time at using, min., no less then:	
- medium severity (lung ventilation 35 dm <sup>3</sup> /min)	90
- heavy (lung ventilation 70 dm <sup>3</sup> /min)	30
- at rest (lung ventilation 10 dm <sup>3</sup> / min)	450
Exploitation temperature range, °C	from – 20 till + 40
Temperature of inhaled breathing gas, °C, no less then	50
Breath resistance (35 dm <sup>3</sup> /min), no less then	70
Outline dimension mm H <sub>2</sub> O	240 x 190 x 120
Self-rescuer mass, kg	4,0
Exploitation warranty period, years	till 7,5

**ShS-90** is supplied with the tightness indicator which allows to carry out tightness visual control according display element color instead of instrument control.

**ShS-90** Has a breath circular scheme which provides absence of toxic substances suction at the breath phase.

# Segregative mine self-rescuer of medium dimension type with chemical with chemical bound oxygen **ShSS-TM**

**ShSS-TM** is intended for respiratory organs protection and eyes at staff evacuation from a dangerous zone with unsuitable breath atmosphere and for primary actions carrying out on emergency expansion prevention at mines, coal producer and other enterprises. Weight reduction till 2,3 kg, in comparison with existing analogs, will provide possibility of constant carrying at regular work performance.

**ShSS-TM 90** provides respiratory organs protection in the atmosphere which contains: CO up to 10%, SO<sub>2</sub> up to 2%, NO<sub>2</sub> up to 1%, H<sub>2</sub>S up to 1%, CO<sub>2</sub> up to 15%, N<sub>2</sub> up to 100%, CH<sub>4</sub> up to 100%, O<sub>2</sub> from 0% and black and stone dust up to 10 g/m<sup>3</sup>.



*Self-rescuer at carrying and using*

Specification	
Defensive action time at using, min., no less then:	
- medium severity (lung ventilation 35 dm <sup>3</sup> /min)	60
- heavy (lung ventilation 70 dm <sup>3</sup> /min)	20
- at rest (lung ventilation 10 dm <sup>3</sup> / min)	300
Exploitation temperature range, °C	from – 20 till + 40
Temperature of inhaled breathing gas, °C, no less then	50
Breath resistance (35 dm <sup>3</sup> /min), no less then	80
Outline dimension, mm H <sub>2</sub> O	234 x 194 x 95
Self-rescuer mass, kg	2,3
Exploitation warranty period, years	till 7,5

# Kuzbasskiy Technopark as the element of Kemerovo region innovative infrastructure



Kuzbasskiy technopark was founded in 2007. It got its name after Kuzbass, the short for Kemerovo region.

The main purpose of Kuzbasskiy technopark is to unite scientific, intellectual and industrial potential of the region for connection between science and business and for achievement of stable development of the region.

The task of Kuzbasskiy Technopark is to provide the innovative project with system of complex support (legal, patent, industrial, consulting), including the search of potential investors.

Basic types of activity of Kuzbasskiy Technopark were defined according to particular features of development of Kemerovo region. Due to the huge mineral resources (brown and hard coal, iron ore, manganese, silver, gold, mercury, tungsten, molybdenum, cobalt, nickel etc.) the region became one of the largest industrial centers in Russia where the leading coal mining, metallurgical, machine building and chemical enterprises are located.

- The development and application of new technologies in the field of coal, ore and nonmetallic minerals extraction, delivery and processing
- The development of machine building and creation of the new technological level equipment for the mining industry
- The development and application of technologies in the field of new functional and constructional materials production, usage of secondary power resources (mine methane, energy of mine waters and air), processing of production wastes, energy saving and resource saving
- The development and application of high technologies in medicine, education, environmental management, life protection
- Participation in forming of the united informational area in Kemerovo region

Innovators are supported by several means. Participants of joint projects with OJSC "Kuzbasskiy technopark" get an opportunity to use its infrastructure and service support:

- Expert evaluation of innovative projects
- Informational support of innovative activity
- Involvement of research organisations and engineering companies for projects support
- Drawing up of business plan
- Attraction of financial investments
- Involvement of qualified personnel for projects realisation
- Maintenance of premises (office, industrial), land etc. under preferential rates

Procedure of getting status of the resident of Kuzbasskiy Technopark is established by the Law "About technoparks in the Kemerovo region". Declarant is to submit innovative project corresponding to basic types of activity of Technopark. If the project gets positive conclusion of Expert council of Kuzbasskiy Technopark, application for the resident status is considered by the Board of Kemerovo region Administration.

Residents of Technopark are given a number of privileges and preferences provided by the regional legislation: the preferential taxation under taxes to property and to profit, reception of budgetary credits and grants to realisation of innovative projects, interest rate subsidising under credits.

On April 15 the business-incubator of Kuzbasskiy Technopark was opened. It is a modern complex building with a fully equipped infrastructure and comfortable working environment. The purpose of the business-incubator is to provide favorable conditions for beginning innovative companies to make a reality of original scientific and technical ideas into business. It assumes consulting, legal and accounting support for the projects, granting office, laboratory and floor spaces under preferential rates that will allow developers to concentrate on realisation and advancement of the projects.

As for today, Kuzbasskiy Technopark set up a data bank of more than 70 innovative projects in the field of new functional and constructional materials production, usage of secondary power resources, processing of production wastes etc.



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