



# ***ARGUS RUSSIAN GENERATION FUELS AND POWER***

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The most up-to-date Argus Russian Generation Fuels and Power methodology is available on [www.argusmedia.com](http://www.argusmedia.com)

## Introduction

Russia is one of the largest producers of electricity in the world. The Russian power sector works mainly on natural gas, which together with fuel oil makes up 51pc of generation fuels. Coal's share is about 19pc, while hydroelectric and nuclear sectors each account for 15pc of the market.

Argus publishes Russian domestic market prices for generation fuels (coal, natural gas, fuel oil) and power in the weekly *Argus Russian Generation Fuels and Power* report ("Argus Топливо и энергетика"). The publication also contains detailed analysis of the latest market developments and important industry statistical data. It is available to subscribers every Tuesday (except for Russian public holidays) in Russian.

## Coal market

Russian producers sell about 70pc of coal production in the domestic market. Coal production is concentrated in Siberia, while smaller quantities of coal are also produced in the North, South and Far East of Russia. Coal is produced by private companies, which include a few major producers, small regional producers and production subsidiaries of large metal holdings. The power generation sector accounts for about a half of total domestic coal sales. The utilities mainly buy coal on annual contracts but there are also deals for quarterly deliveries.

Argus publishes price assessments for steam coal of three commonly used grades: T, D and SS all produced in Kuzbass – Russia's key coal basin in Siberia. Specifications of coal (calorific value, ash content, volatility) can differ within the same grade, and depending on the mine. But all Kuzbass coal has low sulphur content.

Grade T coal is consumed by several power stations in the European part of Russia. This grade is also used by cement producers and other industrial consumers, such as steel mills.

D-grade is most widely used both by power generators and in the municipal heating sector. Coal for heating needs is usually purchased by regional administrations, state organizations, military units and other users through open tenders, normally held ahead of the heating season. Coal for heating needs is sold both by the dealers of large coal producers and numerous small traders.

There are no power stations in Russia built specifically to burn high quality SS grade but it is often used together with other grades to improve boiler efficiency.

### Coal prices

*Argus Russian Generation Fuels and Power* publishes price assessments for the domestic Russian coal market every Tuesday. A schedule of publication is available at [www.argusmedia.com](http://www.argusmedia.com).

The Argus coal team in Moscow contacts a wide cross section of coal market participants through a telephone survey, instant mes-

senger, and email communication. A balance is maintained in the survey between sellers, utility buyers, power generators, and trading companies.

Argus analysts ask market participants in the survey whether they have done or heard of any trade in coal, and whether they have made or received any bids or offers. The participants are asked where they see the level of prices in the market for that day for coal traded on the spot market. The analysts then assess the price of the coal that conform to the specifications listed in the table below on the basis of transactions and buy/sell estimates. All information received by the *Argus Russian Generation Fuels and Power* market reporters/analysts will be used in making the final assessment.

Prices are published in Russian Roubles (Rbs) per metric tonne, excluding value added tax (VAT).

Argus also publishes *Argus Russian Coal*, *Argus Coal Daily International*, *Argus Coal Daily*, *Argus Petroleum Coke*, and *Argus Coal Transportation* as well as market and business intelligence reports on a wide range of other energy markets.

### Key features of assessed coal

Characteristics	Grade SS	Grade D	Grade T
Typical NCV, kcal/kg	6,300	5,100	6,000
Basis and location	fca Kuzbass	fca Kuzbass	fca Kuzbass
Delivery period, days	1-90	1-90	1-90
Size, '000t	>5	>5	>5

### Russian coal price netback

The price netback represents the estimated value of exported coal, on an fca Kuzbass basis. The netback calculation is based on the price of coal cif Amsterdam-Rotterdam-Antwerp in North-West Europe, published in *Argus Coal Daily International*.

The cost of freight from Murmansk and Riga to the ports of North-West Europe is subtracted from the index value. The Murmansk - ARA freight rate is taken from the Friday edition of *Argus Coal Daily International*. The Riga – ARA freight rate is assessed by interviewing market participants.

Then, the cost of loading at the port and related costs, which are also assessed by interviewing market participants, are deducted from the prices fob Murmansk and fob Riga. Port loading costs are usually fixed for a year. Associated costs include shipping agent commission, port agent commission and independent inspection at the port. For fob Riga cost of port loading includes the cost of railway transportation in the territory of Latvia. Expenditures listed in Euros are converted into US dollars at the current exchange rate posted by the Central Bank of Russia.

From the resulting balance Argus deducts the cost of transporting coal by rail from stations in the Kuzbass. In the case of port loading via Murmansk only the cost of transportation in Russia is deducted from the fob price, and if the coal is exported via Riga, then the cost of transportation in the territory of Russia, Belarus and Latvia

(Latvia provides a flat rate that includes the cost of loading and rail transportation) is deducted from the fob price. The cost of transportation in Russia is calculated on an average railway tariff from three different stations in the Kuzbass region, from which the main coal volumes are shipped to Murmansk and Riga. Rates for Belarus are taken from the Economy Ministry of Belarus 10-01 price list. Tariffs in Rubles are converted into US dollars at the current exchange rate posted by the Central Bank of Russia.

## Fuel oil market

Argus assesses the domestic fuel oil market in Russia daily and publishes price quotations in *Argus Russian Fuel Oil* report. *Argus Russian Generation Fuels and Power* analyses the fuel oil market for power generation weekly and publishes average prices for the week before publication for the following basis/locations:

- M-100 fca Moscow refinery
- M-100 fca Ukhta refinery
- M-100 fca Ufa refineries
- M-100 fca Samara refineries
- M-100 fca Omsk refinery
- M-100 fca Khabarovsk refinery

For a detailed explanation of the methodology behind the domestic fuel oil assessments see the [Argus Russian Fuel Oil Methodology](#).

## Natural gas market

### Gas prices

In the absence of liquidity in over-the-counter natural gas markets Argus publishes current regulated tariffs set by the Federal Tariff Service of Russian Federation for industrial users and power generators. Separate tariffs are set quarterly for each region of Russia.

## Power market

Argus publishes weekly analysis of the Russian power market every Tuesday in *Argus Russian Generation Fuels and Power* report. The market commentary covers price movements, changes in supply and demand, outages of power plants and grids, fuel price

changes, fluctuations in water resources of hydropower plants and other fundamental factors.

### Power prices

*Argus Russian Generation Fuels and Power* publishes the following price series:

1. Weekly results of power trades at ATS marketplace (the week from Tuesday through Monday) for both zones of the Russian market (Europe-Urals and Siberia):
  - Weighted average price in the day-ahead market, Rbs/MWh
  - Purchase volume in the day-ahead market, MWh
  - Purchase volume in the regulated segment, MWh
  - Total purchase volume in each market zone, MWh
2. Results of power trading on the ATS platform on Monday:
  - Monday average-weighted day-ahead power price (Rbs/MWh) for each power grid system in the market: Center, North-West, Middle Volga, Urals, South, Siberia
3. Monthly results of power and capacity trading on the Arena exchange:
  - Average prices for power and capacity for every one of the six power grid systems in the market: Centre, North-West, Middle Volga, Urals, South, Siberia, Rbs per lot.
  - Volumes of power and capacity sales (in lots)

Power and capacity are sold on Arena in lots for the particular calendar month. Each lot comprises 0.25 MW of generating capacity and the equivalent amount of power, which depends on the type of contract (base-load, half peak or peak) and the calendar month.

Power prices are published in Russian roubles/MWh, power volumes in MWh, and generation capacity in MW.

### Key data for dark spreads calculation

Region	Coal			Fuel oil		Electricity	
	Grade	NCV, kcal/kg	Transportation route	Basis	Transportation route	Key station	Grid system
Moscow	D	6000	Belovo – Krivandino	fca Moscow refinery	Yanichkino – Krivandino	Shatura GRES	Centre
	T	5100	Tyrgan – Ozherelye			Kashira GRES	
Leningrad	–	–	–	fca Salavat refinery	Allugavat – Avtovo	Avtovo TETS-15	North-West
Ryazan	D	5100	Meret – Voslebovo	fca Ryazan refinery	Stenkino – Voslebovo	Ryazan GRES	Centre
Smolensk	D	5100	Erunakovo – Valutino	fca Ryazan refinery	Stenkino – Valutino	Smolensk GRES	Centre
Sverdlovsk	SS	6300	Bochaty – Maloreftinskaya	fca Omsk refinery	Kombinatnaskaya – Maloreftinskaya	Reftinskaya GRES, Novosverdlovskaya TETS	Urals
Kemerovo	T	6000	Kiyzak – Kaltan	fca Omsk refinery	Kombinatnaskaya – Kaltan	Yuzhniy Kuzbass GRES	Siberia
	SS	6300	Zaboischik – Kemerovo			Kemerovo GRES	
Novosibirsk	D	5100	Meret – Zherebtsovo	fca Omsk refinery	Kombinatnaskaya – Zherebtsovo	Novosibirsk TETS-5	Siberia
Tomsk	D	5100	Erunakovo – Tomsk-1	fca Omsk refinery	Kombinatnaskaya – Tomsk-1	Tomsk GRES-2	Siberia

## Generation economics

Argus spark and dark spreads provide illustrative information about generation economics. They are derived from ATS day-ahead power prices, regulated natural gas tariffs and Argus' fuel oil and coal assessments.

Argus calculates power generation costs for different types of fuel in several regions of Russia. The calculations of spark and dark spreads for each Monday are published weekly in *Argus Russian Generation Fuels and Power* report. Spark (gas) and dark (coal) spreads show the difference between the price of power and fuel costs for its generation.

Argus does not take into account other generation costs (not related to fuel) – such as maintenance or modernization of power plants. Spreads are calculated according to the formula:

$$\text{Spread} = \text{Power price} - (\text{Fuel Price} / \text{Power plant efficiency})$$

Spreads are calculated for five regions of the Europe-Urals zone of the Russian power market (Moscow, Leningrad, Ryazan, Smolensk, Sverdlovsk regions) and for three regions of Siberia (Kemerovo, Novosibirsk and Tomsk regions)

Depending on the region, spreads are calculated for different types of fuel: natural gas, various grades of coal, fuel oil (*see table below for details*).

Gas, coal and fuel oil have different calorific values. The calorific value of natural gas is assumed to be 7900 kcal/m<sup>3</sup>, and fuel oil to

be 9800 kcal/kg. The calorific value for coal depends on the grade of coal (*see table*).

Coal prices used in spread calculations are Argus Russian domestic coal assessments, published in *Argus Russian Generation Fuels and Power* report.

Gas prices used in spread calculations are state-regulated tariffs for particular regions of Russia (for industrial consumers). Gas tariffs are published in *Argus Russian Generation Fuels and Power* report.

Fuel oil prices used in spread calculations are Argus Russian fuel oil assessments for Monday, published in *Argus Russian Fuel Oil* daily report. The fuel oil price assessment methodology is available at [www.argusmedia.com](http://www.argusmedia.com).

Electricity prices used in spread calculations are Monday average-weighted day-ahead power prices for particular power grid systems, where regions chosen for calculation are located (Centre, North-West, Urals, Siberia power grid systems).

Electricity prices are measured in Rbs/MWh and include value-added tax.

Fuel prices used in spread calculations are measured in Rbs/MWh and include transport costs and value-added tax.

Prices for natural gas in Russia are traditionally measured in Rbs/1000m<sup>3</sup>, for coal in Rbs/t and for fuel oil in Rbs/t. Argus uses the following formula to convert traditional fuel prices to Rbs/MWh: