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POLISH IMPORTS OF STEAM COAL FROM THE EAST (CIS)
IN THE YEAR 1990–2011

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Introduction

For several years, import of coal raises a lot of emotions, not only among domestic producers of coal, but also amongst its recipients from both high-energy and municipal and housing sectors.

Taking into consideration the scale of the existing domestic demand for coal, it should be noted that – from a certain period of time – supplies of imported coal are supplementary to domestic production. In addition – since 2008 (the first time in history) Poland is a net importer of this raw material.

Such rapidly rising imports have opened many questions such as:

- where does this coal come from,
- what is its quality,
- what kind of transportation is used during its import,
- which companies are involved in its import,
- who is the final recipient,
- why does Russia sell such large amounts of this raw material to Poland,
- which groups of grades are imported from the CIS countries,
- why imported coal is so competitively priced compared to domestic coal?

Therefore, this monograph aims to systematize the knowledge on coal imports.

The first chapter outlines the situation of domestic mining industry, showing how the production and the demand for coal have changed between 1990 and 2010. Special attention is paid to the years 2006–2007. What is more, the paper describes the changes in the gross calorific value of imported coal during each quarter between 2006 and 2011.

The second chapter focuses on the Russia, Ukraine and Kazakhstan. It presents the general characteristics of the coal industry, including data on resources, production and export of coal. It also includes the data on the major mining companies and presents mining reforms in these countries. Particular attention has been paid to Russia – the main supplier of coal to our country. The chapter also outlines the background of the economic situation on the international coal markets.

The characteristics of coal imports using rail transport are discussed in the third chapter. This mode of transport is used – on average – in 73% of imported coal supplies. The chapter discusses the main rail border crossing and their ability to be used during the transport of coal. An approximate structure of the railway supplies of coal, taking into account rail border crossings and the companies exporting this raw material to Poland, is presented. Meanwhile,

the issue of coal imports by sea and logistical conditions of Polish seaports are presented in chapter four.

Fifth chapter deals with the characteristics of the major importers of coal to the Polish market. The greatest attention has been paid to the Russian and Kazakh coal producers having its representative offices in Poland and the companies importing more than 1 million tonnes of coal each year.

The last, sixth chapter presents the calculation of costs of coal imported by rail from Kuzbass to Poland; various quarters of 2009–2011 have been taken into account. The resulting costs were confronted with domestic prices of coal producers, addressed to non-contractual customers.

Due to the differences in the methodology of aggregating and processing data on production, exports, imports, and coal prices in different countries, the paper uses statistics published by international publishing houses (Coal Information 2003–2011). Therefore, the presented data may slightly differ from the statistics published by the state.

The paper contains a lot of data, presented in charts and included in the tables. It also uses the historical data; however, it wasn't possible to keep the same time series.

During the preparation of this paper, aforementioned international statistics related to the year 2010, so they were updated with the data from 2011. In such cases – due to the nature of the analyzed subject – the author used the data from the official websites of the companies (coal producers, coal traders, transportation companies, companies importing coal, etc...), national statistics and information from the ministries in charge of coal mining.

The author believes that the information and analyzes presented in this paper would allow to introduce and systematize the knowledge on coal imports, especially those from the countries of the Commonwealth of Independent States.

1. Polish imports of steam coal

Many factors contributed to the rising demand for imported coal. One of them is the economic situation in Poland, especially in Polish coal mining. This was also the result of the conditions prevailing on the international markets and the differences in ‘coal’ countries’ exchange rates – including Polish Zloty – against the U.S. dollar, which is the official currency in transactions on the international coal markets.

1.1. The reasons for the intensification of coal imports

The political changes introduced in 1989 were followed by the country’s economic transformation. The decrease in energy consumption recorded in these years has caused the lesser demand for coal in Polish economy. The political changes also affected the domestic coal mining industry. This began the series of reforms included in the subsequent government restructuring programs aimed to adapt the national mining industry to a market economy. They were aimed to achieve economic efficiency of mining entities and to maintain the competitiveness of the Polish coal on the international markets. This subject has been discussed and analyzed by – inter alia – Blaschke 2000; Karbownik, Bijańska 2000; Blaschke ed. 2004; Blaschke et al. 2004; Szlązak 2004; Gawlik 2008; Lorenz 2010, 2011a; Paszcza 2011 and Olkusi 2012.

The impact of subsequent restructuring programs on the production of hard coal between 1990 and 2011 is presented in Figure 1.1. Data on the production (dotted box) were taken from Coal Information (2003–2011). The chart also shows the national demand for coal demonstrated by its consumption (Coal Information 2003–2011). Supply is represented by domestic sales (gray bars) and import (white bars) of hard coal (Szlązak 2004; Informacja o przebiegu... 2003–2007; Informacja o funkcjonowaniu... 2008–2011; Coal Information 2003–2011; data from the Ministry of Economy – www.mg.gov.pl). It might seem, that sales of domestic coal producers did not cover the domestic demand since 2006, thus they were supplemented with imported coal supplies... However, it should be noted, that the competitive price of imported coal – especially in north-eastern Poland – ousted the domestic raw material from the market. In addition, the lack of supplies from domestic producers was accompanied by constant availability of imported coal at fuel yards.

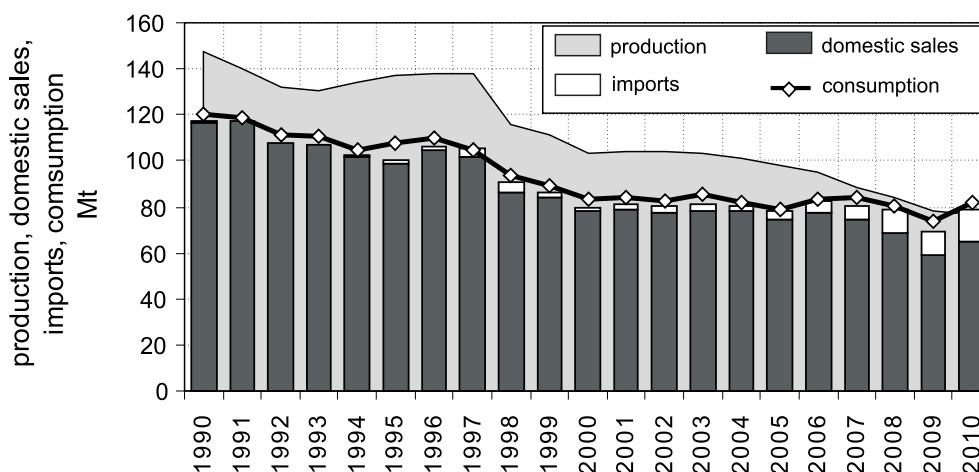


Fig. 1.1. Comparison of production, domestic sales, imports and consumption of coal in Poland, 1990–2010
 Source: own calculations based on Szlązak (2004), Informacja o funkcjonowaniu... (2008–2011), Informacja o przebiegu... (2003–2007), Coal Information (2003–2011), data from Ministry of Economy (www.mg.gov.pl)

Rys. 1.1. Porównanie produkcji oraz sprzedaży, importu i zużycia węgla kamiennego w Polsce, lata 1990–2010

The presented graph is very simplistic; among other things it does not include the movement of the reserves (in power plants, coal mines, coal vendors, etc.). For example, in the end of 2009, the total amount of reserves in steam coal mines, power plants and combined heat and power plants was 12.8 million tonnes of coal (Informacja statystyczna... (2010), (Informacja o funkcjonowaniu... w 2010...).

The amount of imported coal affects not only the demand for this raw material. An important role is also played by government policy.

Before the Polish accession to the European Union, appropriate legislation (eg. Ustawa z dn. 11 kwietnia 2001...; Ustawa z dn. 24 sierpnia 2001...; Ustawa z dn. 21 czerwca 2002...; Ustawa z dn. 26 września 2002...) protected the domestic market against excessive imports of coal. What is more, they were supplemented with the quotas for imports of coal – including coal from Russia and Czech Republic (Rozporządzenie Ministra Gospodarki z dn. 29 grudnia 2001a, b...). Therefore, by 2004 imported coal supplies were merely supplementary. According to the statistics (Coal Information 2003–2011) coal imports did not exceed 2.3 million tonnes up to 2004.

After the Polish accession to the European Union, these acts are no longer in force (Ustawa z dn. 20 kwietnia 2004...). Protection against imports of coal is now a matter of the entire European Union market.

Attempts to increase the economic efficiency of coal mining, accompanied by the deficiency of sufficient investment, have led to shortages of domestic coal.

Between 2006 and 2007 there was an increase in coal use in the power industry. Underestimation of the needs of the energy sector resulted in inappropriate contracts with

mining companies; in 2007, there was a risk of steam coal shortages (Lorenz 2011a). Mining industry complied with its obligations at the expense of export contracts and a decrease in the supply of coal to non-contractual customers. However, domestic customers have begun to consider the supplies from domestic sources as “uncertain”. As a result – both large and individual customers started to look for foreign suppliers. Smaller companies importing coal, with suppliers from the East, took an advantage of this situation.

As a result of increased imports of coal in 2008, Poland became a net importer of coal for the first time in history. Coal imports exceeded its exports by 1.87 million tonnes. In total, Poland imported 10.3 million tonnes of coal (Coal Information 2011).

1.2. The volume and the quality of steam coal imported to Poland

The volume of Polish exports and imports of hard coal and steam coal between 1990 and 2010 is shown in Figure 1.2. It can be observed, that Poland is mainly importing steam coal. In the nineties of the last century, the average share of steam coal stood at 40%, while in the next decade it has increased up to 70%. The dashed line on the graph (Fig 1.2) highlights the period from 2006 to 2010, when Poland was a net importer. In 2010, coal imports were higher than exports by 2.3 million tonnes.

The quality of coal imported to Poland is shown by the statistics of the Agencja Rynku Energii SA – ARE SA (The Energy Market Agency) (quarterly data). The graph (Fig. 1.3)

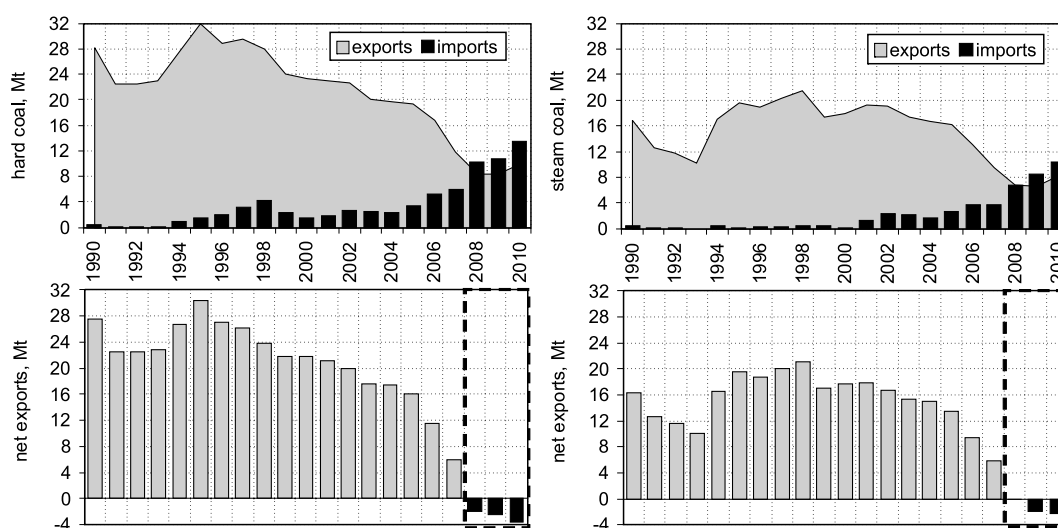


Fig. 1.2. Exports and imports of hard coal (a) and steam coal (b) to Poland, 1990–2010

Source: own work based on Coal Information (2003–2011)

Rys. 1.2. Eksport oraz import węgla kamiennego (a) i energetycznego (b) do Polski, lata 1990–2010

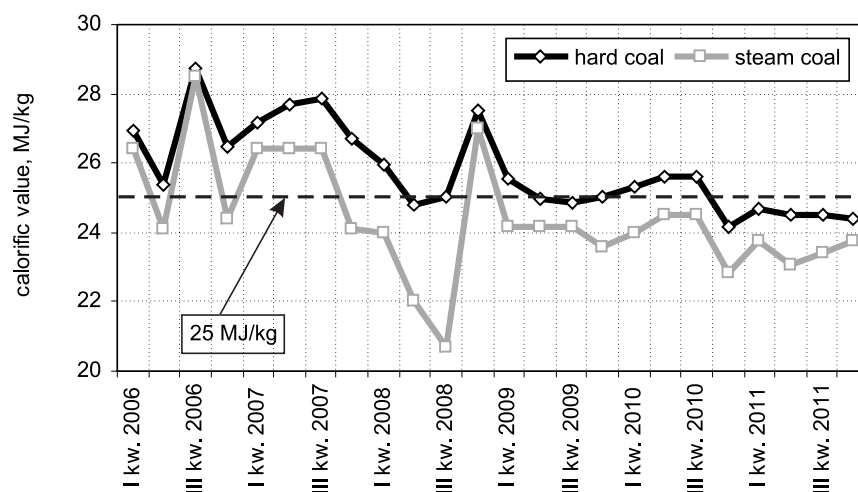


Fig. 1.3. The calorific value of hard coal and steam coal imported to Poland, 2006–2011
Source: own work based on Sytuacja... (2006–2012)

Rys. 1.3. Wartość opałowa importowanego węgla kamiennego i energetycznego do Polski, lata 2006–2011

made on the basis of this data (Sytuacja... 2006–2012) illustrates the calorific value of imported hard and steam coal in each quarter of the period between 2006 and 2011.

National statistics show that the calorific value of imported coal is similar to the standards of the international coal trade. In international transactions, coal prices relate to the coal of standardized quality (Lorenz 2010), i.e. coal with a calorific value as received of 6000 kcal/kg (approximately 25 MJ/kg), sulfur content less than 1% and ash content of up to 15–16%. For ease of comparison, the aforementioned standardized calorific value – 25 MJ/kg – is indicated on the graph with the horizontal dashed line.

1.3. Steam coal exporters from the East

Russia is the main exporter of steam coal to Poland, with an average of 75% of imports of this raw material. In terms of volume of imported raw material, even in 2006, imports from Russia amounted to 2.7 million tonnes (with 71% share in imports), while in 2011 it has risen up to 6.6 million tonnes (with a share of 75%). Other exporters of this raw materials include: Czech Republic, Ukraine and Kazakhstan. In the past two years, the Czech Republic has become the second supplier of steam coal to the Polish market. In 2011, imports from the Czech Republic amounted to 2.0 million tonnes (14%).

Given the import from the East, Poland imports coal mainly from the three countries of the Commonwealth of Independent States (CIS) – Russia, Ukraine and Kazakhstan (Fig. 1.4). National statistics show (data of the Ministry of Economy), that between 2006 and 2011 about 86% (on average) of imports came from these countries (about 6.3 million tonnes).

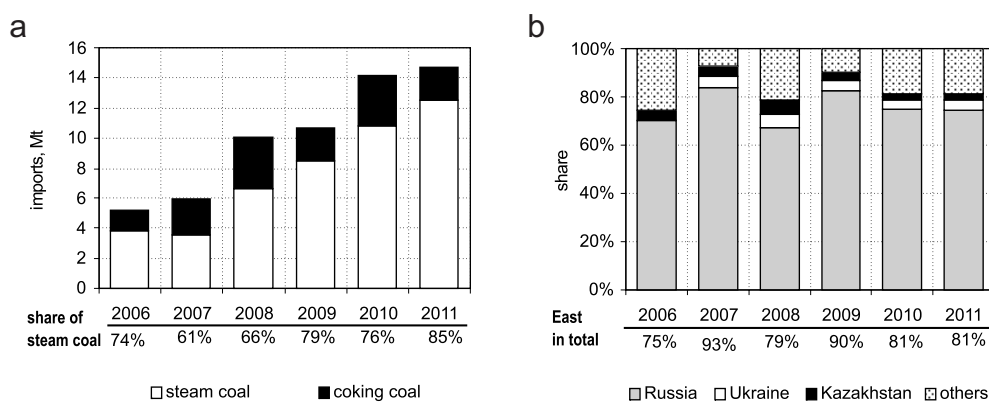


Fig. 1.4. Polish imports of steam coal from the East, 2006–2011

a) the share in total imports, b) the share of suppliers from the East

Source: own work based on the data from the Ministry of Economy (www.mg.gov.pl)

Rys. 1.4. Struktura importu węgla energetycznego do Polski z kierunków wschodnich, lata 2006–2011

a) udział w imporcie ogółem, b) udział dostawców ze Wschodu

1.4. Steam coal import routes

Steam coal is imported to Poland mainly by rail and by sea. The graph (Fig. 1.5) done on the basis of the data of European Statistical Office (<http://epp.eurostat.ec.europa.eu>) allow to estimate that coal is mainly imported by rail (average share between 2006 and 2011: 73%). In 2006, this share amounted to 54%, while in 2011 it has risen up to 79%.

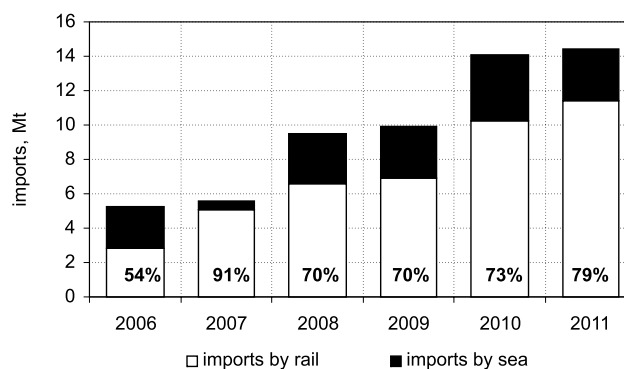


Fig. 1.5. The structure of imports of hard coal to Poland, 2006–2011

Source: own work based on Eurostat (www.epp.eurostat.ec.europa.eu) access on July 12, 2012

Rys. 1.5. Struktura importu węgla kamiennego do Polski, lata 2006–2011

1.5. The main importers of steam coal

Steam coal is imported to Poland from the CIS countries in the following grades: fine grade, unsorted and cobble-nut coal. The latter is equivalent – according to the Polish Classification – to coarse and medium size grades (Stala-Szlugaj, Klim 2012).

The recipients of imported coal – especially the coal from Russia – are both high-energy representatives, as well as non-contractual small customers (mainly households and local boilers and heating plants). This raises the question: what is the approximate share of these two grades in the annual import of coal?

Between 2008 and 2010, the average coal consumption by municipal sector – according to the Central Statistical Office of Poland (GUS) (Zużycie... 2009–2011) – was 12 million tonnes (representing 15% of total consumption). Because of the fact, that during the preparation of this paper the data about the consumption of coal in 2011 was not available, further estimates were based on an assumption that the level of consumption was comparable to 2010.

Smaller consumers usually use coarse and medium-sized grades. Between 2008 and 2010, the average sales of domestic coal producers covered about 61% of their needs, so it is assumed that the rest of the supplies came from of foreign suppliers (Fig. 1.6a).

The difference between the volume of imported steam coal and estimated amount of imported coarse and medium sized grades (Fig. 1.6b) shows the scale of imported fines (47% on average). Regarding the fine grades – mainly consumed by the power industry – it is estimated, that about 2 million tonnes of fine grades were imported in 2008, while in 2011 the imports increased fourfold and increased by as much as 6 million tonnes.

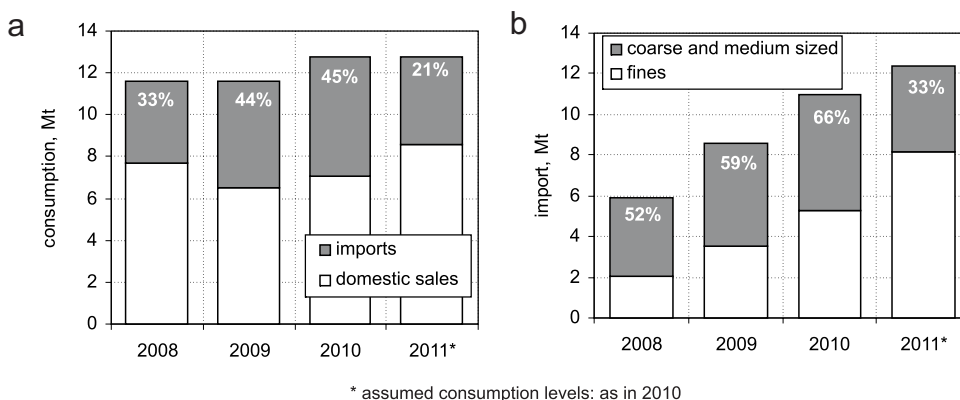


Fig. 1.6. Estimated structure of the imported coarse and medium-sized grades between 2008 and 2011

a) consumed by the sector of small customers, b) Overall imports of steam coal

Source: own calculations based on the coal consumption: data from Central Statistical Office of Poland (Zużycie... 2009–2011), domestic sales and import of coal: own calculations based on the data from the Ministry of Economy (www.mg.gov.pl)

Rys. 1.6. Szacunkowa struktura importowanych sortymentów grubych i średnich w latach 2008–2011

a) zużyte przez sektor drobnych odbiorców, b) w skali krajowego importu węgla energetycznego

2. Countries exporting steam coal to Poland from the East

Among CIS countries, Russia is the main exporter of steam coal to Poland; other important exporters include Ukraine and Kazakhstan.

Russia and Kazakhstan are among the world's top producers of coal. In 2010, 4% of the total coal production (6.19 billion tonnes) came from Russia, while 2% – from Kazakhstan (Fig. 2.1). These countries are also among the largest producers of steam coal, while their share on the world market is 3% and 2%, respectively (Fig. 2.2). In terms of steam coal global exports, Russia's share has risen from 7% in 2000 up to 14% in 2010, while in case of Kazakhstan, from 2% up to 5%.

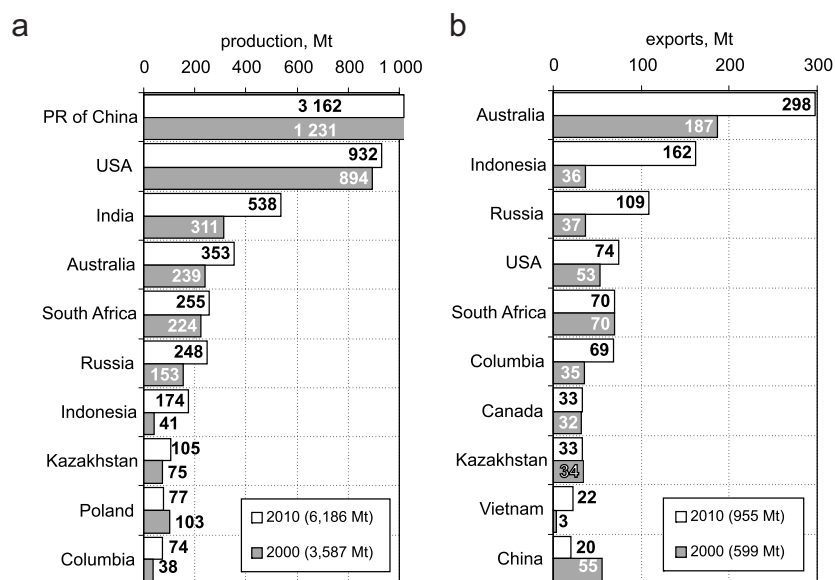


Fig 2.1. World's largest producers (a) and exporters (b) of hard coal
Source: own work based on (Coal Information 2003–2011)

Rys. 2.1. Główni światowi producenci (a) i eksporterzy (b) węgla kamiennego

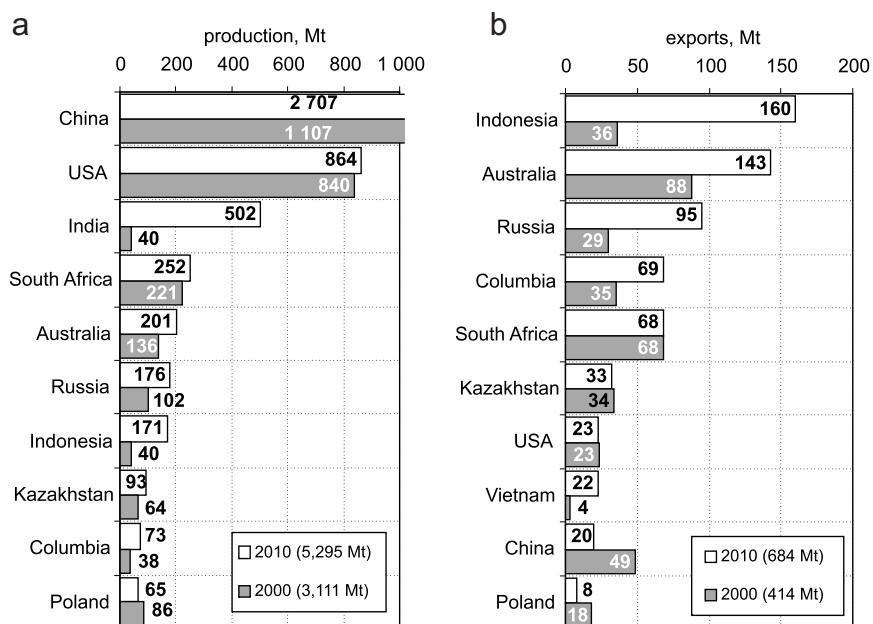


Fig. 2.2. World's largest producers (a) and exporters (b) of steam coal

Source: own work based on (Coal Information 2003–2011)

Rys. 2.2. Główni światowi producenci (a) i eksporterzy (b) węgla energetycznego

2.1. Russia

In terms of coal reserves, Russia (BP... 2012) has the second largest reserves in the world (as of the end of 2011). Proven coal reserves at over 157 billion tonnes, which is broken down into bituminous coal and anthracite (49 billion tonnes), sub-bituminous coal and brown coal (108 billion tonnes). It is estimated, that Russia has 471 years' worth of reserves.

2.1.1. Coal production

Differences in the production of hard coal and steam coal production between 1990 and 2010 are given on Figure 2.3. The data illustrate the changes in the Russian mining industry. It should be noted, that the year 1990 includes the times of the Soviet Union, thus the statistics were collected using different methodology. The following years are associated with a series of reforms, which are accompanied by extensive privatization. There are three main stages of the process of privatization of mining (e.g. Artemiev, Haney 2002). The first stage – so called spontaneous privatization (1990–1994): the largest and most efficient underground mines became private property. The second stage (1995–1997): with participation and

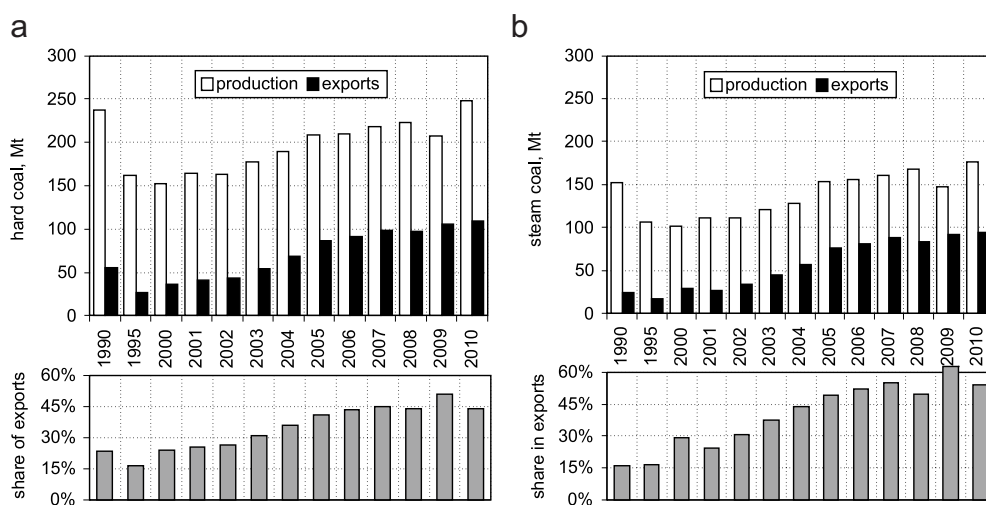


Fig. 2.3. The production and export of hard coal (a) and steam coal (b) in Russia between 1990 and 2010
Source: own work based on Coal Information (2003–2011)

Rys. 2.3. Porównanie produkcji i eksportu węgla kamiennego (a) i energetycznego (b) w Rosji, lata 1990–2010

significant financial support from the World Bank's (so-called SECAL I (Coal Sector Adjustment Loan) worth 500 million USD approved in mid-1996), allowed a more complex restructuring. The end of 1997 marks the beginning of the third period of the privatization (also with the support from the World Bank) – so-called Competitive Direct Privatization.

The lowest production was in 2000, when the production of coal amounted to less than 153 million tonnes, of which 67% was steam coal. In 2010, production increased to the level of 248 million tonnes, while the amount of steam coal reached 176 million tonnes (an increase of 74%) (Fig. 2.3). By 2011, coal mining in Russia has been completely privatized (Tarazanow, 2012) and as a result of the reforms (1994–2009) 203 mines were closed, of which 188 were underground mines, while 15 – open-cast mines (Janowskij 2010). Mines belong to a number of private companies, most often combined into larger organizations with complex ownership structure.

According to official Russian statistics, in 2000 Russia produced 197 million tonnes of steam coal (Fig. 2.4), while in 2010 it increased by 61 million tonnes (35%).

However, there are some differences between Russia, Poland and International Energy Agency (e.g. Coal Information) when it comes to the collection of statistical data. IEA statistics define coking coal as a coal which quality enables the production of coke for blast furnaces. The rest of hard coal is considered as steam coal. In Russia, coking coal and steam coal are also separated, though steam coal is precisely defined by the following parameters (VDKI 2009):

- high content of volatile matter,
- low content of volatile matter,

- anthracite (often used in power industry),
- lignite.

The situation is further complicated by the fact, that the data presented in the Russian statistics relate to the production of raw coal. Different classifications of coal (taking into consideration the content of volatile matter) used in different countries are presented in the Figure 2.5.

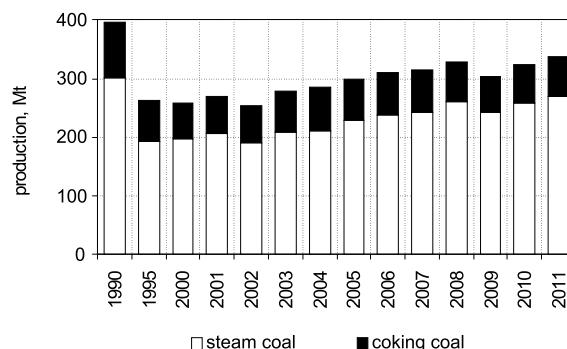


Fig. 2.4. Production of hard coal in Russia between 1990 and 2011

Source: own work based on (Ugolnaja promyslnost..., Tarazanow 2007–2012)

Rys. 2.4. Wydobycie węgla w Rosji, lata 2006–2011

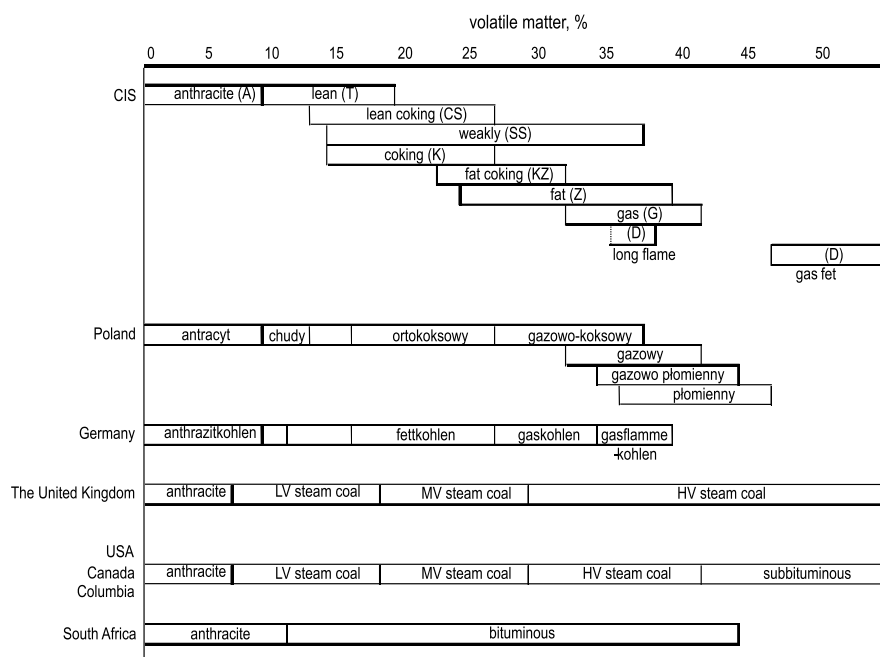


Fig. 2.5. Coal classification systems based on the content of volatile matter, a comparison of selected countries

Source: Walker (2000)

Rys. 2.5. Systemy klasyfikacji węgla oparte na zawartości części lotnych, porównanie wybranych państw

In Russia, there are twenty coal basins, of which 6–7 are of special importance. Three of them are located in Europe (East Donetsk Basin, Moscow Basin and Pechora Basin). Basins located in the Asian part of Russia are divided into Western Siberia (Kuznetsk Basin and Kansk-Achinskiy Basin) and the Far East. In the latter, coal deposits are usually adjacent to the Baikal-Amursk railway line – BAM (Ugolnaja promysliennost..., Yakubov 2006).

Kuznetsk Basin, Kemerovo oblast (called Kuzbass), is the largest producing coalfield of Russia (56–60%) (Fig. 2.6). Steam coal and coking coal are mined using both underground (about 60%) and open-cast mines. What is more, a number of projects related to the construction of new mines and processing plants have been started in the area of Kuzbass (Dołgosrocznaja...). Coal production exceeds 180 million tonnes (2007–2009), of which 86% is coking coal of all types.

Very good quality parameters make Russian coal attractive for both European and Asian market. Due to the comparable (about 4.5 thousand miles) distance from the mining areas to the ports of the Far East and the Baltic states, export routes are determined by the current situation in international coal markets (Stala-Szlugaj, Lorenz 2009).

Second largest producing coalfield of Russia (12–14%) is Kansk-Achinskiy Basin, adjacent to the north-eastern part of Kuzbass (Fig. 2.6). It is characterized by the most important lignite deposits in Southern Siberia (opencast mining).

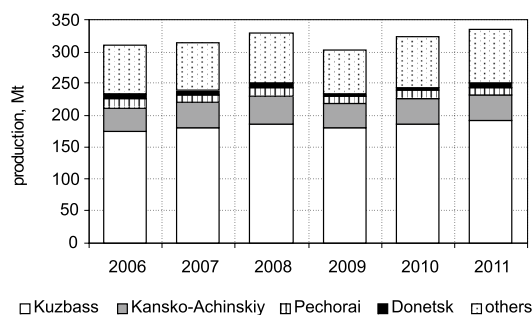


Fig 2.6. Coal production in major mining regions of Russia, 2006–2007

Source: own work based on (Tarazanow 2007–2012)

Rys. 2.6. Wydobycie węgla w głównych rejonach wydobywczych Rosji, lata 2006–2007

Major mining companies

Almost half of Russia's coal production comes from the three companies: SUEK (Siberian Coal Energy Company), UK Kuzbassrazrezugol (KRU) and Mechel (Fig. 2.7), while Mechel is a leading producer of coking coal.

SUEK is Russia's largest coal producing corporation and the most important company in the energy sector. It is also one of the world's leading mining companies and exporters of steam coal. The company was founded in 1999; in 2002 it started to operate under the name of SUEK. In 2003, the company reached its current corporate structure, while in 2005

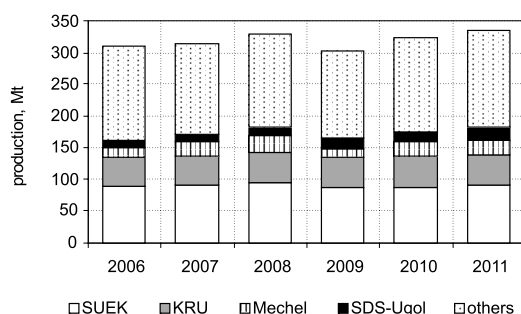


Fig. 2.7. Coal production in major mining companies in Russia, 2006–2011
Source: own work based on (Tarazanow 2007–2012)

Rys. 2.7. Główne spółki wydobywcze w Rosji, lata 2006–2011

it became the largest Russian exporter of coal. Then it was decided to start the construction of Vanino coal terminal in the Russian Far East.

SUEK is the major shareholder in two major Russian energy companies (with total generation capacity of 7 GW), being also their main supplier of fuel. These companies comprise of 18 power plants and heat distribution network with the repair and maintenance services. These companies comprise of 30 power plant companies, six coal preparation plants, as well as companies involved in the transport and handling, and aforementioned Vanino coal terminal.

According to the official statistics (SUEK – Annual... 2011, www.suek.ru), 58% (or 54 million tonnes) of SUEK production in 2011 (92 million tonnes of coal) was hard coal. Although 68% of coal production comes from open-cast mines (including 26% for hard coal), still SUEK has the largest share of production from underground mines of all coal companies in Russia.

Over 74% of the overall coal sales in 2011 accounted for the national power supply (mostly power plants in central Russia and the Russian Far East), while 38% of production (i.e. 34 million tonnes) was exported. The main recipients of coal include: South Korea, United Kingdom (5 million tonnes each), China and Japan (4 million tonnes each), Taiwan and Poland (2 million tonnes each).

The second-largest coal mining company in Russia's is OAO UK Kuzbassrazrezugol (Open Joint Stock Kuzbassrazrezugol). The company was founded in 1998 as an open-cast mine Kuzbassrazrezugol. It was one of the first privatized mines in Russia (during the so-called second stage of privatization). In 2000, its production accounted for about 13% of the total production of coal in Russia (Artemiev, Haney 2002).

The company – of a holding structure – produced 47 million tonnes of coal in 2011 (KRU – Annual report 2011). Production was carried out in eleven open-cast mines. More than half of the production (i.e. 24 million tonnes) was sent for export, mainly to: Turkey (21%), the United Kingdom (16%) and Germany (10%). 223 thousand tonnes of coal (1%) were exported to Poland. International sales are carried out through Kuzbassrazrezugol's

own commercial company Krutrade AG, registered in Vienna. The remainder of the production (47%, or 21 million tonnes) was sold on the domestic market.

Mechel company is the third-largest producer of coal in Russia, though it produces mostly coking coal. In 2011, the volume of coal production was at the level of 22.2 million tonnes of coal, including steam coal amounted to 6.4 million tonnes (Mechel – Annual report 2011).

When it comes to coal exports to Poland, another important producer of coal is Kuzbasskaja Topliwnaja Kompanija – KTK (Kusbasskaya Toplivnaya Company). For several years, Poland is one of the company's major markets. The largest share (45–46%) of exported 6.5 million tonnes of coal was exported to Poland (www.oaoktk.pl). More information about the company can be found in Chapter 5.

2.1.2. Exports of coal and the main customers on the domestic market

The vast majority of coal from Russia is sold on the domestic market, while exports accounted for an average of 35% of total production (1990–2010). In 1995, only 15% of coal production (i.e. 26 million tonnes) was exported, while the best result was obtained in 2010, with 83 million tonnes more (Fig. 2.3a). Similar trends were observed for steam coal: the lowest volume was exported in 1995 (18 million tonnes – 11% share of production), while the highest in 2010 – 95 million tonnes (38% share of production) (Fig. 2.3b). Growing coal exports are very important to Russia. Steam coal exports in 2010 has risen by 441% compared to the 1995 level, while the production increased by 65% (i.e. 69 million tonnes).

The graph (Fig. 2.8) showing the structure of the Russian coal sales between 2000 and 2011 is based on the Russian statistics (Tarazanov 2012). The biggest domestic recipient of coal is power industry, with an average of 35% of production. Meanwhile, 30% of production is exported. In terms of the volume, sales of steam coal accounted for an average of 95 million tonnes. However, coal exports increase much more dynamically than the sale of coal for power production. In 2000, only 15% of its production (i.e., 38 million tonnes) was exported, while in 2011 it has risen up to 38% (i.e. 117 million tonnes). Whereas, there is a reverse trend in sales of coal for power production. In 2000, the total sales accounted for 42% (or 103 million tonnes), while in 2011 they decreased to 31% (96 million tonnes).

According to long-term forecasts (Tarazanov, 2012) the share of sales of coal for power engineering is expected to rise from 32% in 2015 up to 37% in 2030. In terms of the volume, in 2030 it should increase by 15 million tonnes as compared to 2015 levels; approximately 120 million tonnes will be sold. Regarding coal exports, sales to international markets will increase from 105 million tonnes (43% of the total sales) in 2015 up to 170 million tonnes in 2030 (52%).

Major exporters of hard coal from Russia include: SUEK, KRU, SDS–Ugol (Siberian Business Union, SBU) and Mechel (Fig. 2.10), which are responsible for 65% of total exports.

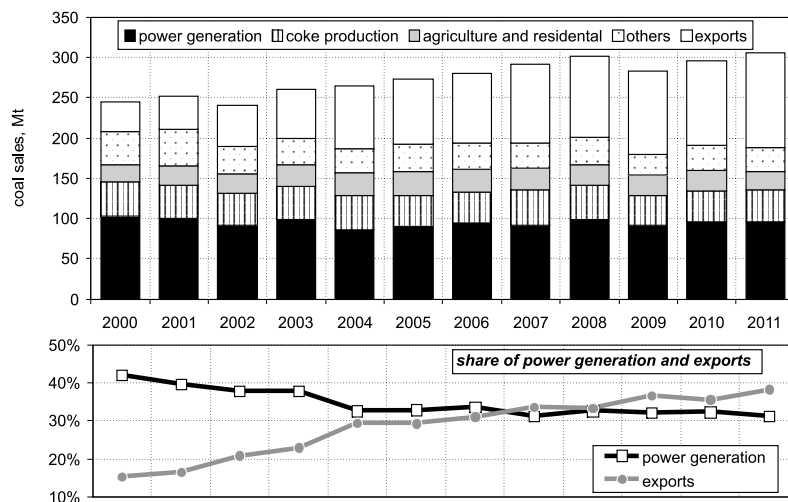


Fig. 2.8. Russian coal sales structure between 2000 and 2011

Source: own work based on (Tarazanov 2012)

Rys. 2.8. Struktura sprzedaży rosyjskiego węgla w latach 2000–2011

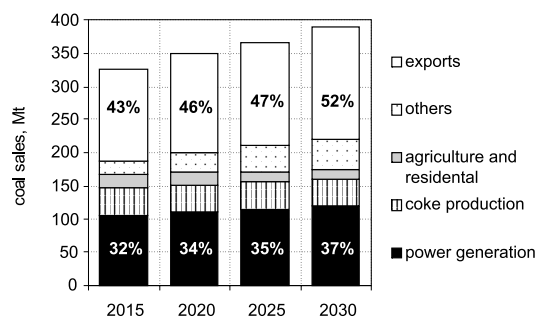


Fig. 2.9. Russian coal sales forecast, 2015–2030

Source: based on (Tarazanov 2012)

Rys. 2.9. Prognoza sprzedaży rosyjskiego węgla w latach 2015–2030

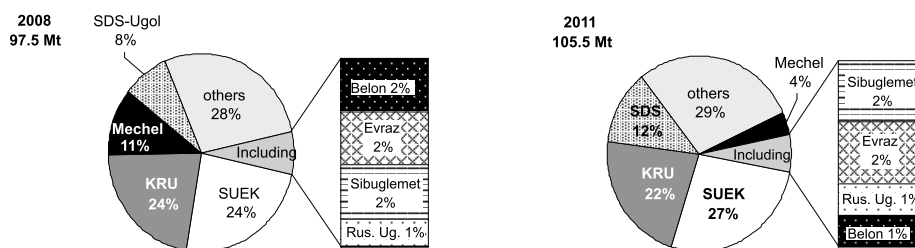


Fig. 2.10. Major exporters of hard coal from Russia in 2008 and 2011

Source: based on (SEUK – Annual Report 2011)

Rys. 2.10. Główni eksporterzy węgla kamiennego z Rosji w roku 2008 i 2011

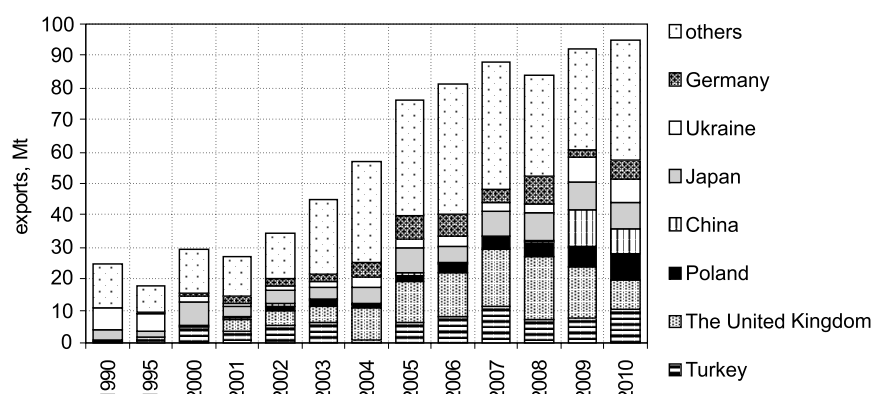


Fig. 2.11 Main recipients of steam coal from Russia, 1990–2010
Source: own calculations based on (Coal Information 2003–2011)

Rys. 2.11. Główni odbiorcy węgla energetycznego z Rosji, lata 1990–2010

For years, the main recipients of coal are both European and Asian countries (Fig. 2.11 – data arranged in descending order). However, the question arises: how important importer of coal is Poland? As shown in Figure 2.11, in 2010 Poland has become – after Turkey and The United Kingdom – the third major recipient of steam coal; the share of exports to Poland increased to 9%. In 2008, the share of exports to Poland was 5% (6th), while in 2009 – 7% (5th place).

As mentioned in Chapter 1 – increased imports of coal in 2008 were a consequence of the implementation of previously signed contracts. Shortage of domestic coal supply forced the Polish power plants to increase imports from Russia. Another important factor that contributed to profitability of imports was the weak position of the U.S. dollar against most currencies (Lorenz 2009). What is more, Russian transport problems and the need to maintain obligatory reserves in domestic power industry resulted in limited supplies of coal for the European market.

Transport problems and shortages of railway wagons in Russia are well known for years. Problems with managing the movement of trains highlighted in the year 2008, just before the crisis. A growing number of private cars has led to an increase of empty return trips, congestion of stations and junctions near seaports, and consequently – to a decrease in efficiency of rail transport.

When it comes to international coal trade, the year 2008 was the most unusual, because international coal markets have experienced the greatest price increases and falls. Reduced demand for electric power resulting from the global economic crisis did not generate additional demand for coal on the spot market (delivery within 90 days). The increase in coal prices in the first half of 2008 was primarily a result of the problems of the world's major coal exporters: Colombia (supply problems), Indonesia (torrential rains and floods, longshoremen strikes), South Africa (supply interruptions due to railway accidents) and Russia (aforementioned problems with transport and obligatory reserves).

Increased demand for coal from China, India and Brazil, the weak position of the U.S. dollar against most currencies and rapidly growing prices of oil and natural gas (Lorenz 2009; Stala-Szlugaj, Lorenz 2010; Grudziński, Szurlej 2011) also affected the situation at the world market. The decline in coal prices in the second half of 2008 was the result of, *inter alia*, reduced demand for coal from China after the Olympic Games in 2008 and the so-called. “speculative factor.” The latter was a consequence of the situation in the first half of 2008. Some buyers and/or coal sellers wanted to take advantage of falling prices and requested larger amounts of coal, hoping that they would earn money by selling at higher prices during the winter. However, the economic downturn resulted in a decrease in coal consumption, and the companies started to sell its surplus at much lower prices.

In 2009, Russia was still feeling the effects of the global crisis. Despite a decline in production and reduced demand on the Russian domestic market, the export of coal increased – compared to 2008 – by 25%, reaching a record level of 105 million tonnes. In the early months of 2009, when demand exceeded supply, the Russian coal producers – even those, who have not previously exported coal to the Polish market (e.g. KRU) – were willingly exporting coal to the Polish market. In the last months of 2009, strengthening of the zloty against the U.S. dollar had a major positive impact on coal imports, while the total coal exports from Russia to Poland amounted to 8.3 million tonnes (Fig. 2.11).

Raspadskaya mine disaster, which occurred in May, 2010, had a major impact on coal production in Russia. It triggered a series of security checks in the mines, resulting in the suspension of mining in some of the coal mines in Kuzbass. It should be noted, that most of the production from these mines is exported to European markets. Also in 2010, Russia suffered from coal transport problems, while at the end of the year reduced the amount of coal for export to sell it on the domestic market before winter (Lorenz 2011b). Despite the many difficulties, Russia exported 92.5 million tonnes of coal, of which the Polish went up 8.6 million tonnes of coal. In comparison with 2009, the Polish export growth was 27%.

Polish official statistics (data of the Ministry of Economy – www.mg.gov.pl) reported that in 2011 Poland imported 9.3 million tonnes of coal from Russia, of which 99.9% was steam coal.

Forecast of coal exports from Russia between 2015–2030

According to the Russian Ministry of Energy (Ministerstwo Energii Rossijskoj Fiedieracji – www.minenergo.gov.ru) coal exports between 2015 and 2020 is expected to be stable at the level of 115 million tonnes, while in 2030 it is expected to rise up to 125 million tonnes (Fig. 2.12). Meanwhile, it is expected, that 85 million tonnes will be sent to the Atlantic market in 2012, of which 10%, or approximately 8.5 million tonnes, will be exported to Poland. Exports to the Pacific market may reach 32 million tonnes. In Europe, the main recipients of Russian gas include: The United Kingdom, Germany, Ukraine, Turkey, Poland and Finland (Fig. 2.12b).

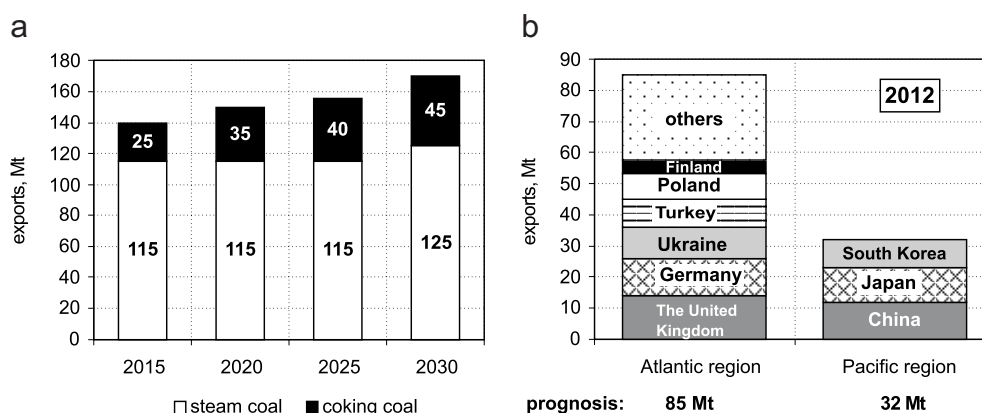


Fig. 2.12. Forecast of coal exports from Russia, specifying
a) exports of steam coal and coking coal between 2015 and 2030, b) main recipients in 2012
Source: own work based on (Janowski 2011, data from the website of Ministry of Economy of Russian Federation, access on 28.08.2012)

Rys. 2.12. Prognoza eksportu węgla z Rosji z wyszczególnieniem
a) eksportu węgla energetycznego i koksowego w 2015–2030, b) głównych odbiorców w roku 2012

2.1.3. Coal exports by sea: transport logistics

Russian coal supplies for international markets are carried out with use of the two types of transport: rail transport and sea transport. Their choice is determined not only by the distance between coal producers and importers, but also by economic factors.

Coal is exported by sea to some of European and Asian countries (e.g. the United Kingdom, Germany, Japan, China and South Korea). When it comes to the neighboring countries of Russia, coal is transported primarily (or exclusively) by rail (e.g. Ukraine or Poland).

Russia – thanks to its geographical location and location of coal deposits – has the potential to export coal to two key international markets: Pacific market (through the ports of the Far East) and the Atlantic market (through the ports of the Baltic Sea, Black Sea and the Sea of Azov).

For several years, the ports of the Baltic Sea are losing their share; in 2006 it was 56%, while in 2011 it dropped to 40%. However, the volume of exported coal increased by 5 million tonnes and amounted to 48 million tonnes in 2011. Meanwhile, the role of the ports of the Far East is increasing. Compared with 2006, exports from these ports increased two-fold and achieved the level of 40 million tonnes of coal. The detailed structure of coal exports by sea between 2004 and 2011 is shown in Figure 2.13. Data comes from the studies of the German Coal Importers Association VDKI – Der Verein Kohlenimporteure e.V.

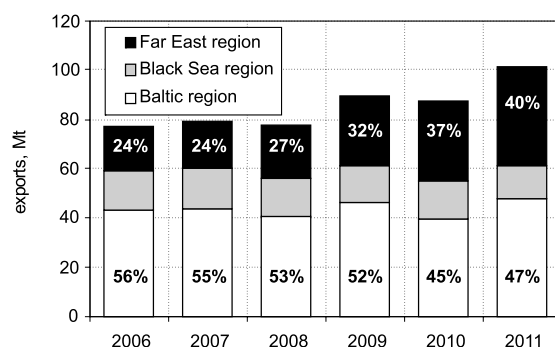


Fig. 2.13. The structure of coal exports by sea between 2006 and 2011

Source: own work based on VDKI (2007–2012)

Rys. 2.13. Struktura morskiego eksportu węgla, lata 2006–2011

With the exception of 2008, when the world began to feel the effects of global economic crisis, sea exports of coal from Russia show a steady upward trend. The main recipients of coal are located around the Atlantic Ocean; meanwhile, up to 61% of deliveries comes from the ports of the Baltic Sea and the Black Sea. The largest increase in the share of exports (about 7 million tonnes, i.e. by 33%) was recorded in 2009 by the Far Eastern ports. This increase resulted from the search for sales in Asia, due to low activity on the spot market in Europe. Meanwhile, the largest decreases occurred in 2008 in the ports of the Baltic Sea, which were associated with the aforementioned global economic crisis.

The fall in coal exports in 2010 was the result of many factors. They included, among other things, lower demand and lower prices in Europe (resulting with reduced deliveries to the United Kingdom and Germany). Due to the lower demand in Europe, producers are increasingly redirecting their supplies of coal to the ports of the Far East. In July 2010 – for

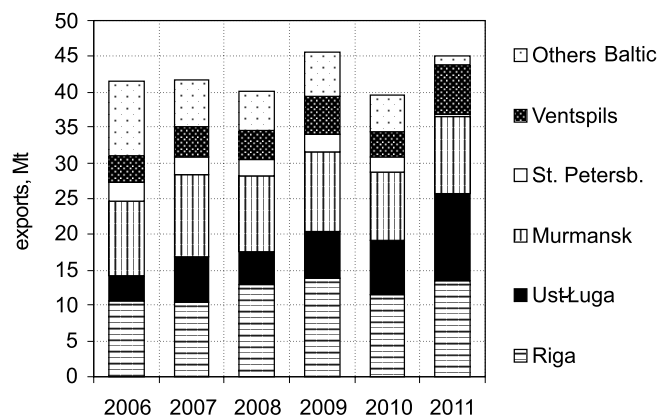


Fig. 2.14. Russian coal exports by sea from the ports of the Baltic Sea

Source: own work based on VDKI (2007–2012)

Rys. 2.14. Morski eksport węgla z Rosji z portów Bałtyku i Pn. Rosji, lata 2006–2011

the first time in history – exports to Asia were higher than exports to Europe, while in August 2010, they equaled (and amounted to 3 million tonnes in both directions).

Half of Russian coal exports by sea is exported through the ports of Baltic region. Between 2006 and 2011, the average volume of coal exports through the ports was about 44 million tonnes. Usually, coal was exported from the port of Riga, Ust-Luga and Murmansk (Fig. 2.14).

Murmansk

Located above the Arctic Circle, on the Kola Bay, sea port in Murmansk (Murmansk Oblast) is the only one non-freezing port in this part of Russia.

The port of Murmansk was founded in 1994 as a state-owned company “Murmanskij Morskoj Torgovyj Port”, aimed at handling bulk cargo and passenger traffic. The port operates 24 hours a day all year round. Within the three sectors there are 16 anchoring locations extending over a length of 3 km (www.portmurmansk.ru). Thanks to its parameters, the port can handle Panamax class ships (with capacity of 80 thousand tonnes) with the intensity of 20 thousand tonnes per day. The port has over 13 hectares of storage space (including 2.1 hectares of indoor warehouse). In addition, all warehouses and moorings are equipped with suitable underground car roads and railroad tracks, enabling loading or unloading directly from ship to wagon (and vice versa). The port is also equipped with proper handling and transportation infrastructure (e.g. cranes with a lifting capacity of up to 40 tonnes, car loaders – from 1.5 up to 45 tonnes, tractors, roll-trailers for loads of up to 40 tonnes and bulldozers).

Murmansk is an export port, while its exports are dominated by coal. Other exports include apatite concentrate, iron and non-ferrous metals. Coal is imported mainly to Western Europe (including Spain, the Netherlands, Belgium, France and the United Kingdom). The key exporters of coal from the port are coal companies, including SUEK, Mechel Energy, Krutrade (a company owned by KRU) and Coeclerici Coal and Fuels. According to the official data for 2011, the port of Murmansk exported over 10.8 million tonnes of coal (www.portmurmansk.ru).

Over the past few years, a number of modernizations allowed to expanded warehouse space (www.portmurmansk.ru). Also port cranes were modernized, while the deepening of the mooring No. 4 allowed the port to handle Panamax class ships and Capesize vessels (with capacity of over 140 thousand tonnes). Taking into account the export of coal, it is planned to build a special complex for processing this raw material, located in the “Wtoroj Gruzowoj Rajon No. 2” (ENCLOSURE II 2nd Cargo district). What is more, transshipments of oil and gas, related to the development of the mineral extraction in the Arctic, are also planned.

Ust-Luga

The port Ust-Luga is situated on the Luga River near its entry into the Luga Bay of the Gulf of Finland, around 110 kilometers west of St. Petersburg. This port is located at the intersection of two intermodal transport corridors: The North–South Transport Corridor

(linking the Baltic Sea, the Black Sea and the Caspian Sea) and The East–West Transport Corridor (between Europe and Asia). Its location plays an important role in organizing the transit of goods within the European transport infrastructure.

Port of Ust-Luga (Morskoj Torgowyj Port Ust-Luga) is a relatively new port. In order to build the port, the company “Ust-Luga Kompanija” was founded in 1992. For the first time in Russia, quadripartite agreement between the Ministry of Transport of the Russian Federation, the Russian railways RZhD, Leningrad Oblast authorities and the „Ust-Luga Kompanija” was signed (www.ust-luga.ru).

Ust-Luga is expected to become next – after Primorsk – major oil port in this part of Russia. Oil port of Ust-Luga is of great strategic importance because, as it is the final destination of the Baltic Pipeline System-2 (BTS-2). It will allow solving the problem of Russian oil transit via Belarus.

The port includes six specialized terminals handling coal, sulphur, cars, containers, iron and pig iron, crude oil and its products. In 2011, the port of Ust-Luga exported 12.4 million tonnes of coal (www.ust-luga.ru).

Ultimately, it is expected to build 12 terminals handling coal, general cargo, bulk, liquid bulk, containers and wood. The port of Ust-Luga also provides passenger services.

Thanks to its geographical position, the port can operate almost continuously throughout the year (it freezes only for 40 days a year). Deepening of the entrance channel (up to 16 m depth), together with its 3.5 km length, made it the only port on the Baltic Sea, which is capable to handle bulk carriers of up to 75 thousand tonnes and tankers of up to 120 thousand tonnes (www.ust-luga.ru).

A disadvantage of the port is its sandy bottom. Deepening of the entrance channel will need to be repeated regularly, because of the sediments carried by the river and the sea. However, because the development of the port of Ust-Luga is under special control of the Russian government, while the port includes both oil and coal terminals, maintaining adequate depth of the entrance channel and adequate navigation conditions will be a priority for the government (Stala-Szlugaj 2011).

Coal Terminal has a 560 meter long quay with a depth of 16 m and 53 acres of warehouses. With the modernization work carried out in 2010, Ust-Luga coal terminal reached a handling capacity of 12 million tonnes per year (www.ust-luga.ru).

Riga

Latvian port of Riga (Rīžskij Svobodnyj Port) is located on the Gulf of Riga, at the mouth of the Daugava river. The geographical location of the port, together with a well-developed network of railways and roads, allowing convenient communication between the port and its clients from the CIS countries and the European Union. Enables export and import of various commodity products, as well as passenger services.

Situated on both sides of the Daugava river, with an area of over 6 thousand hectares, the port has almost 13 km of quays. The terminals can handle bulk commodities (e.g. coal, fertilizers, grains, aggregates, sugar), liquids (crude oil), general cargo (milk

powder, iron, cotton, rubber, natural rubber and wood), containers, wheeled cargo and vehicles (so-called roll-on/roll-off vessels designed to carry cars, trucks, wagons and agricultural machinery).

Coal is handled in the coal terminal, being the part of the Riga Central Terminal (RCT), and in the dry bulk cargo terminal STREK. In total (according to data www.rop.lv), 13.5 million tonnes of coal were exported from the port of Riga in 2011.

The Riga Central Terminal (www.rigact.lv) has a 2.4 km long quay of a depth of 11.7 m, so it can handle vessels with a capacity of 55 thousand tonnes. In addition, RCT has 13 moorings and 100 mobile cranes (with a maximum load capacity of 45 tonnes). A major advantage is the large storage area (15.8 ha including 5.98 ha of magazines), which allows to store up to 700 thousand tonnes of coal. The terminal also features a 19.5-kilometer long railway system able to simultaneously handle 400 wagons.

STREK terminal with two moorings, 25 thousand m² of open space warehouses, 23 port cranes (with a capacity of 5 up to 40 tonnes), coal sorting and crushing machines and magnetic separators (magnetic separation of coal) is designed to handle Panamax class vessels (with capacity of 75 thousand tonnes). The annual handling capacity of the terminal is 4 million tonnes of cargo (www.strek.net).

Tense political situation between Russia and Belarus combined with the Russian policy of reorientation of the export-import freight traffic through own ports, the year 2010 marked a significant decrease in cargo handling in the port of Riga (including coal and oil). Because of the redirection of crude oil to the Russian port of Ust-Luga, Riga sees hope in the transit of Venezuelan oil to Belarus refineries.

Despite the Russian politics, many Russian companies which are co-investors of terminals – including coal terminals – are still interested in further cooperation with the port in Riga. In this situation (due to the reduction in handling of energy resources), the port of Riga is now focusing on strategic diversification of products considered as agricultural products (cereals, vegetable oils) and metallurgical products. What is more, the port focuses on the goods transported in containers (with particular emphasis on transfer of goods from China to Russia). Another activity is the transit of non-lethal NATO supplies to Afghanistan. Furthermore, also the handling of wood is increasing. It is the result of the Latvian timber sales to Russia and Ukraine, as well as the handling of timber from Belarus and Russia to Norway and Germany.

Ventspils

The port of Ventspils, situated at the mouth of the Venta River and the Baltic Sea, is handling bulk cargo and passenger traffic. Ventspils is an ice-free port, so it can operate the whole year. In addition, the port is also an important transit center. Currently, handling of goods is carried out on 50% of the cargo handling capacity. In 2011, coal handling amounted to 6.6 million tonnes (www.portofventspils.lv).

Ten specialized terminals allow handling of bulk liquids (oil and oil derivatives, fruit juices and chemical raw materials, e.g. ammonia, different spirits), bulk commodities (e.g.

metals, coal, grains, sugar), general cargo (e.g. wood, wood pieces) and goods in containers (www.portofventspils.lv).

Handling of coal takes place in a specialized coal terminal BCT (Baltic Coal Terminal – www.balticcoal.com). BCT coal terminal was opened on November 21, 2008. The terminal is equipped with a rail infrastructure, wagon tipplers, heated warehouses used to defrost coal in wagons and magnetic separators used for magnetic separation of coal. Due to the environmental protection (keeping the standards required by the European Union), 240 thousand tonnes of coal and the conveyor lines transporting coal to the pier (with a length of 2.5 km) are located in roofed warehouses. In addition, all production lines are equipped with coal dust collection system. What is more, there is a new pier for loading ships with a capacity of 120 thousand tonnes and a maximum draft of 15.5 m.

BCT joint-stock company was founded by Ventspils Tirdzniecības Osta (VTO) – coal company from Ventspils and Indtec Baltic Coal – a company associated with the Ukrainian Donetsktal. Donetsktal is the owner of the assets and producer in the largest coal mine in Kuzbass – Zarechnaya.

According to the decree of the Minister of Transport of the Russian Federation of May 12, 2005 (Ob utwierżenii...) – Russia will put emphasis on the development of native ports in order to develop foreign trade. This will increase their handling capacity. However, it will also force the modernization of the existing railway system and the construction of new roads to enable the transport of coal from the mining areas to ports.

Taking into account coal imports to Poland, the key role is played by the ports of the Baltic Sea. During the six analyzed years, an average of 38% of Russian coal exports by sea (i.e. 33 million tonnes) were exported from these ports. According to the plans for the development of the coal mining industry (Janowskij 2011), Russia wants to export coal to Asian markets (Fig. 2.15). It is expected, that the ports of the Russian Far East will handle 70% of the coal exports by sea (about 32 million tonnes) in 2030, while the exports through the ports of the Baltic Sea are expected to decrease to 14 million tonnes (23% share).

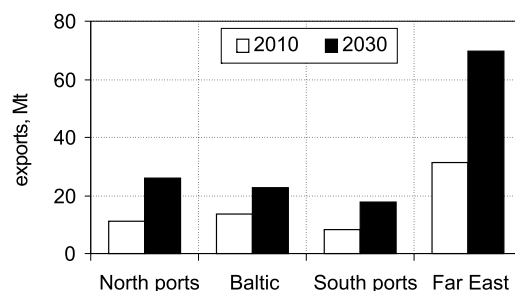


Fig. 2.15. Forecast of the development of exports from Russian ports in 2030

Source: own work based on Janowskij (2011)

Rys. 2.15. Prognoza rozwoju eksportu z portów rosyjskich w roku 2030

2.1.4. Coal exports by rail: transport logistics

The main cargoes transported by Russian rail include coal, crude oil and its products, building materials, iron grains, etc. Just like in Poland, hard coal is also the most important cargo transported by rail in Russia. Between 2000 and 2011, its average share in the total volume of cargo was 23% (Fig. 2.16). Compared to 2000, transportation of coal in 2011 increased by 22%, i.e. by 54 million tonnes, and achieved the level of 296 million tonnes.

The year 2009 marked a significant decrease in the transport of goods. This was due to the world economic crisis, though the crisis of the Russian Railways dates back to October 23, 2008. From this date on, there has been a drastic reduction in the total rail transports (Ambajewa 2009). Then the transportation of coal recorded the highest (25%) share in the cargoes transported by rail (Fig. 2.16). Compared with 2008, total cargos decreased by 15% (i.e. about 196 million tonnes) while the transport of coal decreased by 21 million tonnes (7%).

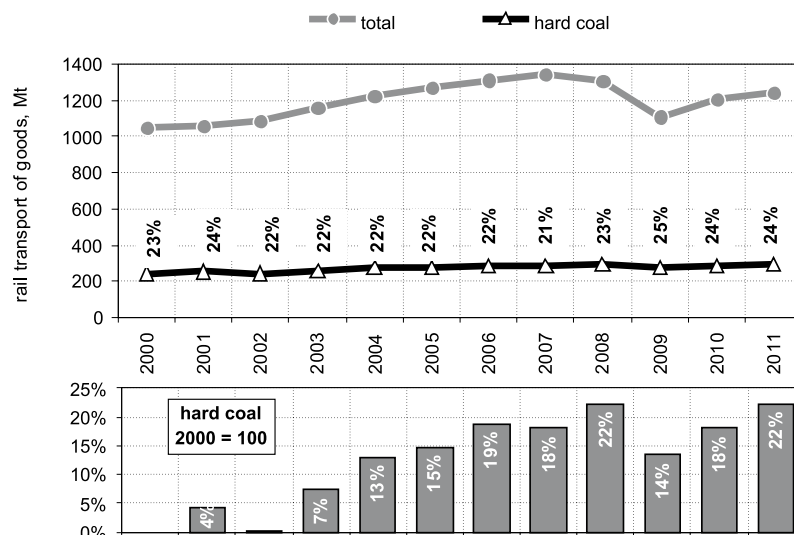


Fig. 2.16. Total rail transport of goods and rail transport of hard coal in Russia between 2000 and 2011
Source: own work based on (Rosstat – www.gks.ru)

Rys. 2.16. Przewozy kolejowe towarów ogółem oraz węgla kamiennego w Rosji, lata 2000–2011

Reforms of the Russian railway sector

Reforms of the railway sector in Russia were launched on May 18, 2001 (O programmie strukturalnej...). The government program is aimed to, among others, increase affordability, safety and quality of rail services. Other objectives include: a balanced system of transportation, reduction of government spending on rail, satisfying the demand for rail services.

There are three stages of reforming the railway sector (O programie strukturalnej...). Phase I, also called the preparatory stage, lasted from 2001 to 2002. It relied on the development of legislative proposals and other legal acts necessary for the implementation of the program. As a result, the state-owned company, Rossijskije Železnye Dorogi (RZhD), was founded. The second phase lasted from 2003 to 2005. One of its objectives was to create favorable conditions to increase the level of competition in cargo and passenger transport. The last phase (2006–2010) was aimed to attract investors.

The change in the ownership structure of the rail is a result of the reforms of the Russian railways (Fig. 2.17). Back in 2003, the railway transport was dominated by the public sector companies (71%), while in 2011 the private sector already had 55% market share.

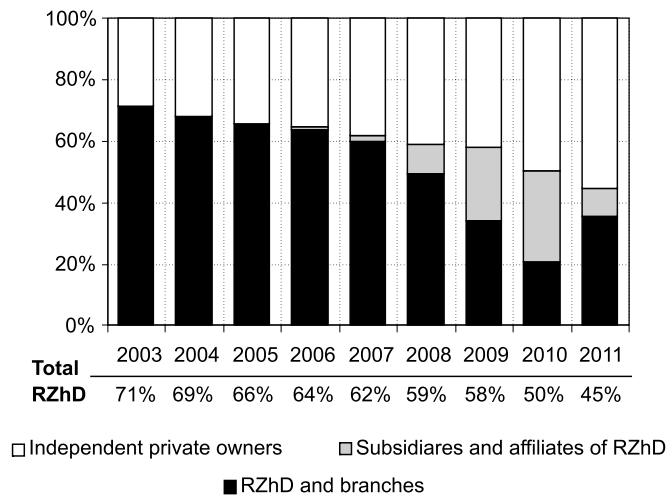


Fig. 2.17. The structure of Russia's rail transport, 2003–2011

Source: own work based on (RZhD – Annual report 2010, 2011)

Rys. 2.17. Struktura kolejowych przewozów w Rosji według przewoźników, lata 2003–2011

Russian Railways

Railway transport in Russia is dominated by state-owned JSCo Russian Railways – RZhD and its subsidiaries. Therefore, the company is the largest and the most important company on the market. RZhD was established in October 2003 as a result of the second stage of the reform of the railway sector.

The total length of the railways is 85.2 thousand km, while the length of electrified lines – 42.9 thousand km. RZhD has a total of 624.9 thousand freight wagons of all types and 11.1 thousand freight locomotives: both electric locomotives and diesel locomotives (www.rzd.ru).

RZhD is the administrator of sixteen railway lines and provider of cargo services. The longest of aforementioned lines (10.4 thousand Miles) is the Oktiabrskaja railway line,

which transported a total of 247 million tonnes of cargo in 2011. However, the highest volumes of cargo – 310 million tonnes – were transported with use of the Juzno-Ural line. Table 2.1 contains statistics on the length of railroads and mass of cargo transported in 2011. The data are ranked by the length of railway lines in descending order.

Due to the privatization of the Russian Railways, most of the transports of coal are provided by the units belonging to the private sector. However, there is a great diversity in terms of the size of the wagons. By the end of 2011, Russia had 1.1 million units of wagons, of which 57% (i.e. 619 thousand of units) was owned by the private sector, 37% (i.e. 398 thousand of units) – by the subsidiaries of RZhD, and only 6% (i.e. 68 thousand of units) was in the hands of state-owned Russian Railways (Novotrans – Annual report 2011).

Table 2.1

The volume of the cargo transported by the Russian Railways in 2011

Tabela 2.1

Masa przewiezionych ładunków liniami kolejowymi RŻD w 2011

L.	Railway	Zeleznaja Doroga	Length	Share	Mt
			tys. km	%	mln ton
1.	October	Oktiabrskaja	10.4	12%	247.4
2.	Moscow	Moskowskaja	8.8	10%	73.0
3.	Sverdlovsk	Sverdłowskaja	7.2	8%	124.2
4.	Far Eastern	Dalniewostoczna	6.8	8%	49.3
5.	North Caucasus	Sewero-Kawkazkaja	6.3	7%	169.7
6.	Northern	Sewernaja	6.0	7%	224.8
7.	West Siberian	Zapadno-Sibirskaja	5.6	7%	261.5
8.	Gorky	Gorkowskaja	5.3	6%	39.9
9.	South-Uralsk	Yuzno-Uralskaja	4.8	6%	309.8
10.	Kuibyshev	Kuibyszewskaja	4.8	6%	67.0
11.	Privolzhsk	Priwolszkaja	4.3	5%	35.7
12.	South-Eastern	Jugo-Wastoczna	4.2	5%	82.5
13.	East Siberian	Vostoczno-Sibirskaja	3.9	5%	160.9
14.	Trans-Baikal	Zabajkalskaja	3.3	4%	130.5
15.	Krasnoyarsk	Krasnojarskaja	3.2	4%	72.7
16.	Kaliningrad	Kalinigradskaja	0.6	1%	14.7
Total			85.2	100%	2 063.6

Source: own work based on (RZhD – Annual report 2011, www.rzd.ru)

The transport of dry bulk (coal, ores, wood) in Russia is carried out with use of platforms. So-called „Poluwagon” is an open high-sided wagon, easy to load and unload. There are 4-, 6- and 8- axle wagons (<http://railsite.ru/poluvagon.php>). The carrying capacity of these wagons varies from 62 tonnes (poluwagon 12-726) to 125 tonnes (poluwagon 12-508).

According to the official data for 2011 (www.rzd.ru), RZhD lent 461 thousand of wagons to other companies, including 88 and 86 thousand of units to its two major companies – PGK and JCG. The detailed structure of the major leasing companies is presented in the Fig. 2.18.

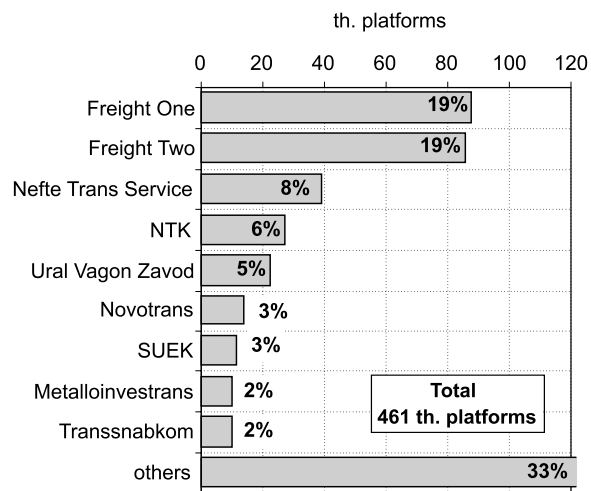


Fig. 2.18. The structure of the main leaseholders of platforms from the Russian Railways
Source: own calculations based on (www.rzd.ru)

Rys. 2.18. Struktura głównych dzierżawców poluwagonów od spółki RŻD

Table 2.2

Major operators of platforms (poluwagon) to carry coal in Russia

Tabela 2.2

Główni operatorzy węglarek (poluwagonów) w Rosji

Wagon operator	Poluwagon	Coal producers	Poluwagon
	thousands		thousands
PGK (Freight One)	83	SUEK	4
WGK (Freight Two)	136	KRU	2
NPK	25	Mechel (Mechel-Trans)	9
Novotrans	13	SDS-Ugol (Novotrans)	13

Source: own calculations on the basis of the official data of the companies

Perwaja Gruzowaja Kompanija (PGK), Wtoraja Gruzowaja Kompanija (JCG), Novotrans Holding Company (belonging to the SDS-Ugol) and Nowaja Perewozocznaja Kompanija (NPK) belonging to Globaltrans – all play a leading role among the private operators (Stala-Szlugaj, Klim 2012). The first three companies have a total fleet of 244 thousand wagons (Table 2.2).

Perwaja Gruzowaja Kompanija – PGK (www.pgkweb.ru)

OAo Perwaja Gruzowaja Kompanija (OJSC Freight One Company – Freight One) was established in July 2007 as a subsidiary of the state-owned Russian Railways RZhD. At the beginning of its operation, it received 10 thousand wagons from RZhD. Currently, the company operates a fleet of 83 thousand platforms used for the transport of coal and other cargo (iron, non-ferrous metals, cement, etc.).

OJSC Freight One Company includes 14 companies providing services throughout Russia. The company has its subsidiaries in Ukraine and Finland (Freight One Ukraine and Freight One Scandinavia, respectively). Freight One handles both domestic and export traffic. The company's clients include coal companies, such as: Mechel, KRU, SDS-Ugol, SUEK and Zarechnaya Mine.

Wtoraja Gruzowaja Kompanija – WGK (www.vgk.org.ru)

Another major rail carrier is Wtoraja Gruzowaja Kompanija OAo (OJSC Freight Two Company – Freight Two). Freight Two was established at the end of August, 2010, as the second subsidiary of the Russian Railways RZhD. RZhD owns 99% of its shares, while 1% is owned by “Baminvest”.

Freight Two handles cargo of coal companies, metallurgic companies, petroleum and construction companies. It operates a fleet of 136 thousand platforms used for the transport of coal and other cargo. The company's clients include coal companies, such as: SUEK, Evraz Holding, Mechel-Trans, Severstal and Russkij Ugol.

Nowaja Perewozocznaja Kompanija – NPK (www.npktrans.ru)

OAo Nowaja Perewozocznaja Kompanija (NPK) transports metals, bulk oil and oil products, coal, wood products and other commodities. Globaltrans Group holds 100 percent of the shares of NPK, being the only shareholder of the company.

It operates a fleet of 25 thousand platforms, used by the coal companies, such as: EvrazHolding, Mechel, Severstal, SUEK, Russkij Ugol and Jakutugol. Coal and other cargo are transported across Russia, as well as in Lithuania, Latvia, Estonia, Belarus, Ukraine and China.

Novotrans (www.hc-novotrans.ru)

OAo Holdingovaya Kompaniya Novotrans (Novotrans) is a part of the holding company Siberian Business Union (SDS-Ugol). Meanwhile, 96% of its fleet – (13 thousand of units) are platforms. Novotrans transports metals and metal products, coal, wood pulp, chemicals, chemical products and refined petroleum.

Currently, Novotrans consists of nine subsidiaries. Daughter company: Gruzovaya Kompaniya Novotrans handles the transport of goods in platforms – including coal – through Russia, Poland, Ukraine, Kazakhstan, Latvia, Lithuania, Estonia, Finland and China.

2.1.5. Russian steam coal prices on the international market

Russia is a major exporter of coal to both Atlantic and Pacific markets. Other suppliers of the Atlantic Region include Poland and the countries of North and South America. Meanwhile, coal customers – in addition to the European Union countries – include Eastern Europe and the Mediterranean countries. In case of the Asian market, the receivers include Japan, South Korea, India, China, Taiwan and Hong Kong. Coal supplies come mainly from Australia, Indonesia, Russia, Vietnam and China. (China is an important supplier as well as a receiver of coal).

International trade prices refer to certain indices of standardized coal quality parameters. They relate to the prices at the port of shipment, when the freight and other expenses are paid by the importer (FOB – Free On Board), and to the prices at the port of destination, when the

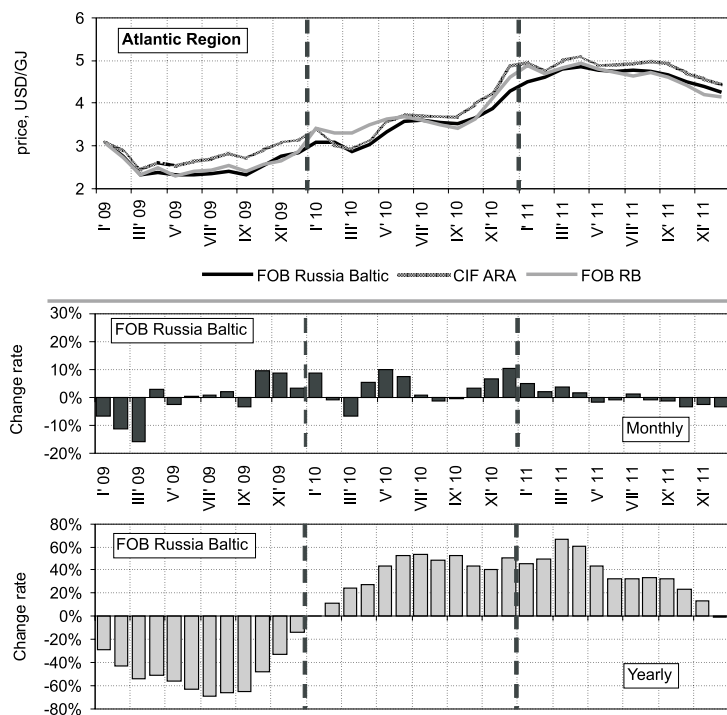


Fig. 2.19. Comparison of monthly average spot prices of steam coal in exports (FOB) and imports (CIF) on the European market

Source: own calculations

Rys. 2.19. Porównanie średnich miesięcznych cen *spot* węgla energetycznego w eksporcie (FOB) i imporcie (CIF) na rynku europejskim

insurance and freight are all paid by the exporter (CIF – Cost, Insurance and Freight) (e.g. Lorenz, Grudziński 2005, 2009).

Prices of the Russian steam coal exported to European and Asian markets during the period from January 2009 to December 2011 are shown in Figures 2.19 and 2.20, respectively. Presented prices refer to the spot market – short-term contracts with deliveries within 90 days (Lorenz, Grudziński 2005). These graphs present the general trends on the international coal markets.

Compared prices (known as indices or indexes) relate to coal of standardized quality parameters, already mentioned in Chapter 1. Monthly averaged prices of coal (calculated on the basis of daily coal price indexes) are expressed in energy units. Coal prices are taken from the following industry magazines: Argus, Platts and an online trading platform globalCOAL.

Regarding the European market, the prices of coal in the Baltic ports of Russia (FOB Baltic Russia) and in the port of Richards Bay, South Africa (FOB RB) were taken into account. When it comes to imports – the prices of the most important ports in Western Europe: Amsterdam-Rotterdam-Antwerp (CIF ARA) were taken into consideration.

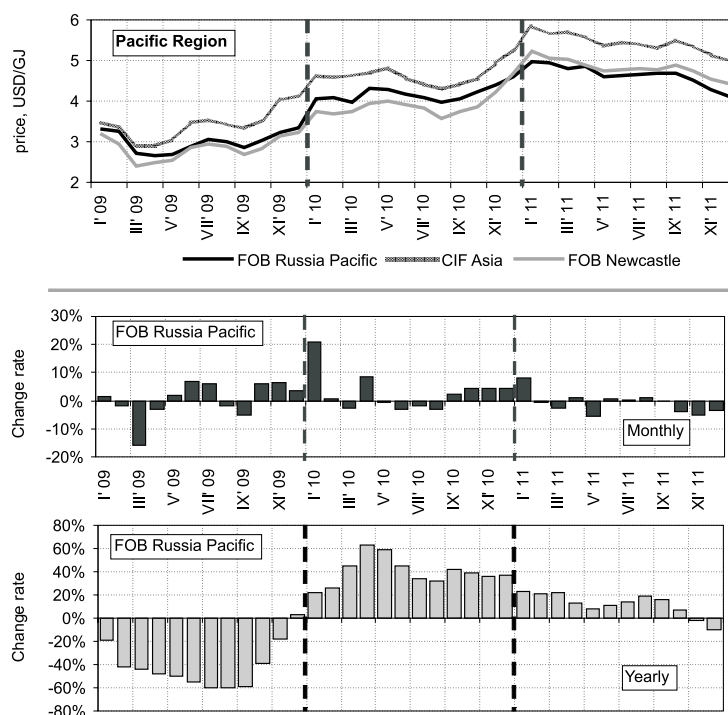


Fig. 2.20. Comparison of monthly average spot prices of steam coal in exports (FOB) and imports (CIF) on the Asian market

Source: own calculations

Rys. 2.20. Porównanie średnich miesięcznych cen *spot* węgla energetycznego w eksporcie (FOB) i imporcie (CIF) na rynku azjatyckim

FOB Baltic Russia prices changed in similar way as the other coal prices on the European market – basing on FOB RB and CIF ARA. Russian prices showed a constant upward trend for almost the whole analyzed period. In April, 2011 prices increased 110% compared to March 2009. The analysis of monthly changes (month to the previous month) has shown that the largest (16%) drop in prices occurred in March, 2009, while the largest increase (10%) – in May and December, 2010. In case of the annual reports (month to the same month of the previous year), the year 2009 was characterized by lower prices compared to 2008, while the changes between 2009 and 2011 (in spite of their different levels) show an increase in prices. On the international coal market, the year 2008 was unusual, because it experienced the greatest price increases and falls (eg Lorenz 2009).

For the Asian Region (Fig. 2.20), the exporters included Russia (Russia FOB Asia) and the Australian port of Newcastle (FOB NEWC), while the CIF prices in Asia show the prices in the ports of Japan and Korea.

Similarly, the price of coal exported for the Pacific market remained at a steady upward trend. The lowest prices of Russian gas occurred in April, 2009, while the highest in January, 2011 (a difference of about 87%). When it comes to the monthly changes, the biggest (16%) drop in prices occurred in March, 2009, while the largest increase (21%) – in January, 2011. In case of annual reports, they maintained a similar trend to that observed on the European market.

2.1.6. Coal compared to other Russian energy sources

Russia has abundant fossil fuel resources (Table 2.3): it holds the world's largest natural gas reserves, the second-largest coal reserves, and the eight-largest crude oil reserves.

Table 2.3

Proved reserves of coal, oil and natural gas at the end of 2011

Tabela 2.3

Stan zasobów węgla, ropy naftowej i gazu ziemnego w Rosji, koniec 2011 roku

Fuel	Coal		Oil		Gas	
	million tonnes		thousand million barrels		trillion cubic meters	
	2001	2011	2000	2011	2000	2011
Total World	984 453	860 938	1 257.9	1 652.6	154.3	208.4
Russia	157 010	157 010	88.2	68.5	42.3	44.6
Share	16%	18%	5%	5%	27%	21%
Ranking	2 position	2 position	8 position	8 position	1 position	1 position

Source: own work based on (BP... 2001, BP... 2011)

As of the end of 2011, Russia had 24 years' worth of reserves oil and 74 years worth of reserves of natural gas (BP... 2012).

Russia is also among the world's leading producers and consumers of coal, oil and natural gas (Table 2.4). In 2011 Russia recorded an increase in their production; compared to the year 2000, the production increased 36%, 58% and 15%, respectively. Meanwhile, the consumption of coal, natural gas and crude oil, increased by half and amounted to 20% and 10%.

Coal and natural gas are one of the main fossil fuels used to produce energy (electricity and heat) in Russia. These fuels comprise 2/3 of electric power (16% and 50%, respectively), while the remainder is produced in nuclear power plants and water power plants (16%) (Table 2.5).

Increasing prices of natural gas and the lack of environmental fees charged to mines give an opportunity to increase the share of coal-based energy in the primary energy balance.

Table 2.4

Russia – Comparison of the production and consumption of coal, oil and natural gas in 2000 and 2011

Tabela 2.4

Rosja – porównanie produkcji i zużycia węgla, ropy i gazu w roku 2000 i 2011

Fuel	2000	Share	Top-ten position	2011	Share	Top-ten position	± 2011/2000	
	Mtoe	%		Mtoe	%		%	
Production								
Coal	Russia	116.0	5%	6	157.3	4%	6	↑ 36%
	World	2 354.3	100%	—	3 955.5	100%	—	↑ 68%
Oil	Russia	323.3*	9%	3	511.4*	13%	2	↑ 58%
	World	3 618.2*	100%	—	3 995.6*	100%	—	↑ 10%
Natural gas	Russia	475.7	22%	2	546.3	18%	2	↑ 15%
	World	2 176.8	100%	—	2 954.8	100%	—	↑ 36%
Consumption								
Coal	Russia	105.2	4%	4	157.3	4%	6	↑ 50%
	World	2 354.3	100%	—	3 955.5	100%	—	↑ 68%
Oil	Russia	123.1*	3%	5	136.0*	3%	5	↑ 10%
	World	3 571.8*	100%	—	4 059.1*	100%	—	↑ 14%
Natural gas	Russia	318.6	15%	2	382.1	13%	2	↑ 20%
	World	2 176.8	100%	—	2 905.6	100%	—	↑ 33%

* Mt

Source: own work based on (BP... 2001, BP... 2012)

Another possibility is the involvement of large energy companies in projects and investments in coal mining (Lorenz 2008).

Russia is the world's fourth producer of electric power. In comparison with 2001, its production in 2010 increased by 17% and amounted to 1,036 TWh (Table 2.5).

Table 2.5

Russia – Electricity production from fossil, hydro and nuclear fuels

Tabela 2.5

Rosja – porównanie produkcji energii elektrycznej według paliw

Specification	Unit	2001	Top-ten position	2010	Top-ten position	Change ± 2010/2001	
Electricity Prod.	Russia	TWh	889	4	1 036	4	↑ 17%
	World		15 476	–	21 431	–	↑ 38%
Electricity Export	Russia	TWh	26	6	17	4	↓ –35%
	World		487	–	235	–	↓ –52%
Electricity production from fossil fuels							
Coal	Russia	TWh	169	8	166	9	↓ –2%
	World		5 992	–	8 698	–	↑ 45%
Oil	Russia	TWh	30	8	l.d.	l.d.	–
	World		1 168	–	989		↓ –15%
Gas	Russia	TWh	377	2	521	2	↑ 38%
	World		2 828	–	4 768	–	↑ 69%
Hydro Electricity							
Production	Russia	TWh	176	5	168	5	↓ –5%
	World		2 646		3 516		↑ 33%
Installed capacity	Russia	GW	44	6	47*	6	↑ 7%
	World		755		396*		↓ –48%
Nuclear electricity							
Production	Russia	TWh	137	5	170	4	↑ 24%
	World		2 653		2 756		↑ 4%
Installed capacity	Russia	GW	21	5	24	4	↑ 14%
	World		356		375		↑ 5%

* 2009 data

Source: own work based on (Key World...2003, 2012)

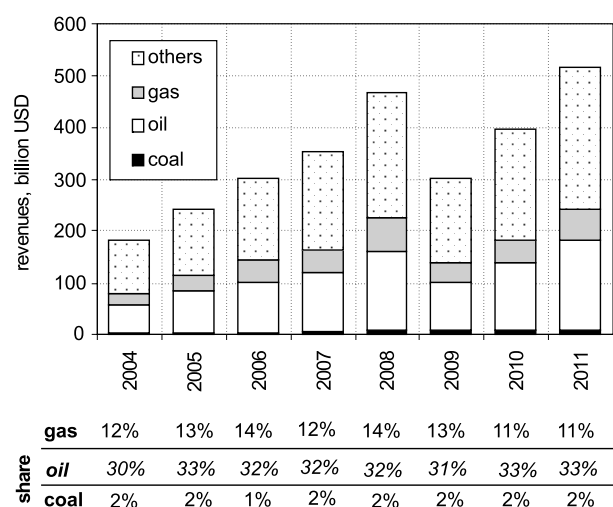


Fig. 2.21. Russia's revenues from the export of energy resources, 2004–2011

Source: own calculations based on the data from the Federal Customs Service of Russia (www.customs.ru)

Rys. 2.21. Przychody z eksportu surowców energetycznych z Rosji, lata 2004–2011

Russia exports more than half (approximately 53%) of crude oil production and nearly one third of production of natural gas (31%). These fuels provide about 45% of Russia's export earnings (i.e. about 145 billion U.S. dollars) (Fig. 2.21); therefore, these fuels have become strategic 'export' energy resources. Revenues from coal exports are at an average level of 6 billion USD (2%). The chart presents the clear impact of high commodity prices on the revenues from exports in 2008. In 2009, as a result of the global economic crisis, revenues dropped to the 2006 levels.

2.2. Ukraine

Ukraine is the second supplier of coal from CIS countries to Poland. Ukraine has the seventh largest reserves of coal in the world. Of the 34 billion tonnes of proven coal estimated at the end of 2010, 45% included anthracite and bituminous coal (15 billion tonnes), while sub-bituminous coal and lignite amounted to 19 billion tonnes (BP... 2012).

2.2.1. Production and export of coal

As in Russia, coal production and export levels between 1990 and 2010 have varied (Fig. 2.22). However, the lowest production occurred in 2010, with only 54 million tonnes of coal (of which 65% was steam coal).

In order to improve the economic condition of coal mining, Ukraine carried out a series of economic reforms. The last of them – covering the period between 2010 and

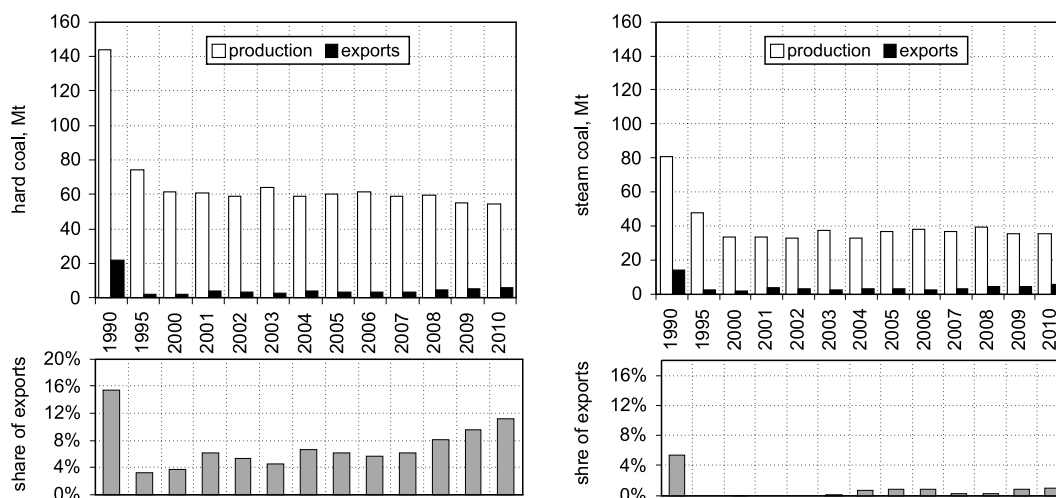


Fig. 2.22. Comparison of production and exports of hard coal (a) and steam coal (b) in Ukraine, 1990–2010

Source: own work based on Coal Information (2003–2011)

Rys. 2.22. Porównanie produkcji i eksportu węgla kamiennego (a) i energetycznego (b) na Ukrainie, lata 1990–2010

2014 – takes advantage of EU subsidies, and is aimed at privatization of the mines and finding potential investors (Handrich et al. 2009). In 2010 (data from the Ministry of Fuel and Energy of Ukraine.... – www.mpe.kmu.gov.ua) the share of coal production from the state owned mines was 51% (39 million tonnes), while in 2011 it decreased to 47% (i.e. 82 million tonnes). State owned mines are economically inefficient, dangerous and have outdated machinery. Ukrainian coal mining requires significant investment in order to modernize the infra- structure and to allow exploration and development of coal deposits.

Reforms of the Ukrainian coal mining are expected to be implemented in three stages (Handrich et al. 2009). During the first stage (until the end of 2010), all coal companies were classified into the two categories: potentially attractive or unprofitable. The second and third phase (2011–2014) implement the process of market liberalization and the closure of unprofitable coal mines and companies, including state-owned company “Coal of Ukraine” (the intermediary between coal producing corporations and power generating companies).

Almost two thirds produced coal is steam coal; the production between 2000 and 2010 was at the level of 33–40 million tonnes (Fig. 2.22b). Coal is mined mainly in the eastern part of the country in the Donetsk Coal Basin (the Donbas including Donetsk and Luhansk circuit), the Dnipropetrowsk Oblast and in the Lvov-Volyn Coal Basin. According to the official data (www.mpe.kmu.gov.ua), in 2011 82 million tonnes of coal (an increase of 9%, or about 7 million tonnes compared to 2010) were produced, of which 57 million tonnes was steam coal (production growth of 12%, i.e. about 6 million tonnes).

In 2011, the state sector included twenty coal mining groups and five independent coal mines (www.mpe.kmu.gov.ua). The greatest representative of the private sector is an energy holding Donbasskaja Topliwno-Energetyczeskaja Kompanija (DTEK, Donbass Fuel-Energy Company).

DTEK was founded in 2002. The holding includes mines and coal preparation plants, power plants and plants distributing electricity. 28 DTEK coal mines are concentrated in subsidiaries. In 2011, DTEK mines produced 37 million tonnes of coal (47% of the coal production in Ukraine), of which 41% – that is 15 million tonnes – was steam coal. Steam coal is produced in ten mines by the subsidiaries of Pavlogradugol OJSC, providing quarter of its production in Ukraine. Particularly attractive export product is the coal with a sulphur content below 0.1%, which has a lot of customers (e.g. in Turkey). However, this is a phenomenon, as Ukrainian coals generally contain a lot of sulphur, resulting with low export prices (DTEK, Annual report 2011).

Almost entire production of steam coal is sold on the domestic market, while only a small part of the production (4–10% in 2000–2010) is exported (Fig. 2.22b). The volume of exports is limited not only by the size of coal consumption on the domestic market. Specific natural conditions are responsible for the high ash and sulphur content of steam coal (Handrich et al. 2009). Bearing in mind the environmental restrictions in the EU countries, these quality parameters make it impossible to export about 95% of Ukrainian steam coal.

The main recipients of the Ukrainian coal include Bulgaria, Turkey, Belgium and Poland (Fig. 2.23). In 2010, Poland was the fourth largest importer of coal from Ukraine. Despite the fact that the coal exported to Poland was classified as steam coal, yet the majority of it (80–90%) was anthracite. These differences may be the result of different classifications of coal used in the former Soviet Union and Poland (see Fig. 2.4). On the other hand, in Ukraine anthracite is also used for the production of electricity, which also may have contributed to arising inaccuracies.

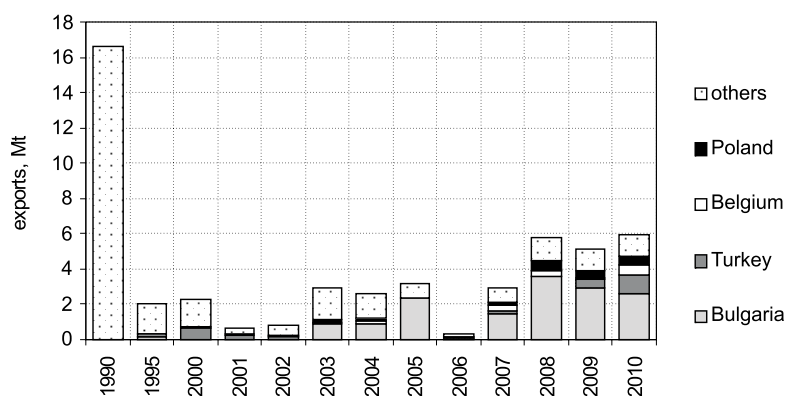


Fig. 2.23. Main recipients of steam coal from Ukraine, 1990–2010
Source: own calculations based on Coal Information (2003–2011)

Rys. 2.23. Główni odbiorcy węgla energetycznego z Ukrainy, lata 1990–2010

2.2.2. The main recipients of coal on the Ukrainian domestic market

Almost the whole production of Ukrainian coal (90%) is used by the power sector, while the other recipients include: metallurgy (4%), cement industry and individual customers (3% each) (Onowliennaja...).

Of the 49 GW of power (as of end of 2010), nearly half is installed in the power plants based on fossil fuels: mainly coal (41%) natural gas (8%) while 29 percent accounts for the power plants based on nuclear fuel (Onowliennaja...).

According to long-term plans (Onowliennaja...), by 2030, the share of installed capacity of power plants based on coal is expected to reach (depending on the scenario):

- 26% i.e. 14 GW – according to the pessimistic scenario,
- 30% i.e. 20 GW – according to the baseline scenario,
- 35% i.e. 26 GW – according to the optimistic scenario.

In 2012, in order to become independent from the supplies of natural gas from Russia, Ukraine has decided to use some of its natural gas power plants to burn domestic coal. In order to do that, Ukraine is planning to use the money from the loan (granted by the China Development Bank) for the development of Ukrainian coal mining.

2.2.3. Railway transport

When it comes to coal imports from Ukraine to Poland, an important role is played by rail transport. According to official Ukrainian statistics (www.ukrstat.gov.ua), the total length of railways in operation is 21.6 thousand kilometers (as of 2011), of which almost half is electrified.

Hard coal (with an average market share of 27%) has a dominant share within the overall structure of cargo transported by Ukrainian railways. Meanwhile, market share of iron and manganese is approximately 18%, while the market share of ferrous metals is about 13%. In relation to 2000, coal transports in 2011 increased by 6% and reached 104 million tonnes. In terms of the volume, the largest amounts of coal (i.e. 129 million tonnes) were transported in 2008 (Fig. 2.24).

The most important railways are Ukrainian state railways – Ukrzaliznicja (Ukrzaliznytsia, UZ). Founded in 1991, UZ operates 82% of the freight traffic in Ukraine. UZ has a fleet of 133 thousand wagons, while half of them include platforms for the transport of coal, ore minerals, fluxes and other bulk materials (www.uz.gov.ua). In terms of the volume of cargo, Ukrainian railways rank second in Europe, losing only to the Russian railways RZhD.

In the overall structure of the transports, international transports account for 21%. More than 93% is from the CIS countries (including about 80% from Russia, 8% from Kazakhstan, 5% from Belarus and Moldova), while the countries of the European Union account for only 2%. The share of hard coal in the total volume of cargo is only 11%. The mostly exported raw

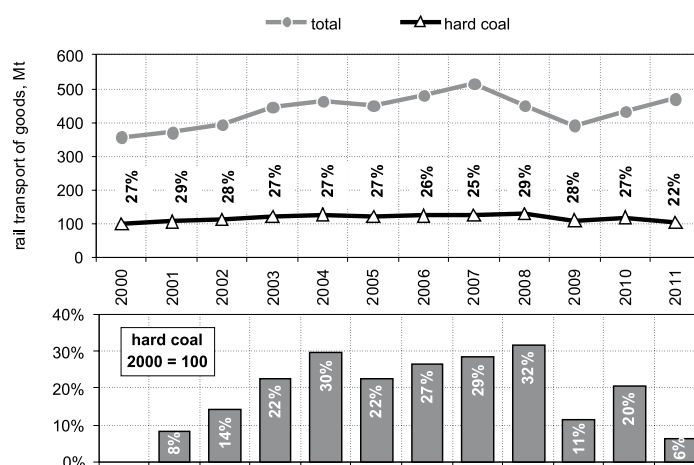


Fig. 2.24. Ukraine – total rail transport of goods and rail transport of hard coal, 2000–2011

Source: own work based on (www.ukrstat.gov.ua, Transport i zwiazok... 2011)

Rys. 2.24. Ukraina – przewozy kolejowe towarów ogółem oraz węgla kamiennego, lata 2000–2011

materials include: ferrous metals (21%), iron and manganese ores and building materials (18% each) (Pieriegud 2009).

2.3. Kazakhstan

World's eighth producer of hard coal in 2010 (Fig. 2.1) is another major exporter of coal to the Polish market. Kazakhstan has the world's eighth largest coal reserves. Proven reserves of anthracite and bituminous coal at the end of 2011 were estimated at the level of 22 billion tons, while sub-bituminous coal and lignite reserves amounted to 12 billion tonnes (BP... 2012).

2.3.1. Production and export of coal

The largest coal deposits are located in the Karaganda Coal Basin and the Ekibastuz Coal Basin (hard coal and lignite). Hard coal is produced in both open-pit mines and underground mines. Approximately 85–90% of its production (Fig. 2.25) is a steam coal mainly produced in open-pit mines of the Ekibastuz Coal Basin. Coking coal is produced in underground mines of the Karaganda Coal Basin.

As in Russia and Ukraine, coal production in Kazakhstan between 1990 and 2010 has varied (Fig. 2.25). The best results were obtained in 1991, bringing 130 million tonnes of coal. In the following years, the country has focused on the overall economic transformation. Subsidies for mining were stopped, while the government froze the prices of coal for a long period of time. Some mines were closed, some of the mining companies were privatized,

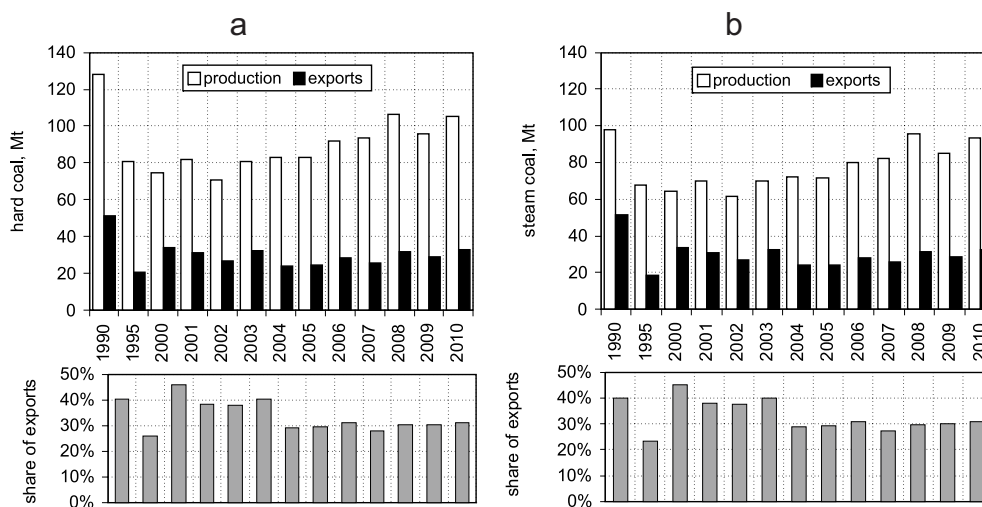


Fig. 2.25. Comparison of the production and exports of hard coal (a) and steam coal (b) in Kazakhstan, 1990–2010

Source: own work based on Coal Information (2003–2011)

Rys. 2.25. Porównanie produkcji i eksportu węgla kamiennego (a) i energetycznego (b) w Kazachstanie, lata 1990–2010

while the new owners did not invest in their development. All of these factors contributed to the reduction in coal production (Obzor ugolnoj...). In comparison with 1990, coal production in 2000 fell by 53 million tonnes (i.e. 41%); in case of steam coal, fell by 34 million tonnes (i.e. 35%). Currently, average coal production remains at the same level for a number of years, amounting to 98 million tonnes (Fig. 2.25). According to Kazakh official statistics (www.stat.kz), coal production in 2011 amounted to 116 million tonnes and has increased 5% (i.e. about 6 million tons) compared to the year 2010.

The recipient of the majority of Kazakh coal production is an internal market (mainly power sector), while approximately 31–38% of the production is exported (Fig. 2.25). Almost all (99%) export deliveries are consumed by the Russian power sector (mainly power plants in Yekaterinburg and Chelyabinsk). Such export structure is related to the collapse of the Soviet Union: as a result, Kazakhstan took control of the mines of the Soviet Union, though the power plants receiving coal remained Russian. In recent years (2004–2010) the annual supply of coal to power stations in Russia was at the level of about 26–32 million tonnes. Remaining coal exports are directed mostly to Poland (0.8% share in 2010) and Finland (0.2%).

Coal imported to Poland from Kazakhstan is transported by rail. Average distances from Kazakh producers of coal to the Polish border are comparable with the distances from the Kuznetsk Basin in Russia and are about 4.5 thousand km.

There are thirty coal mining companies in Kazakhstan. Steam coal is produced mainly in the mines belonging to the following companies: Bogatyr Komir and Eurasian Natural

Resources Corporation – ENCR (Shubarkol Komir and Razrez Vostochny) (O koncepcji..., Janturejewa 2009).

The origins of Bogatyr Komir (Bogatyr Access Komir, LLP) date back to 1996, when the Bogatyr and Stiepnj mines were privatized. Since 2009, the company has been operating under the name of Bogatyr Komir. The state holding company Samruk-Kazyna and the Russian United Company Rusal U.S. (part of SUAL, one of the leading manufacturers of aluminum in the world) are the shareholders of the Bogatyr Komir. The coal is produced in open-pit mines, while its recipients are mostly Russian and Kazakh power plants (95%) and municipal and household sector (5%). Transport of coal is handled by the two rail operators: Kazakhstan Temir Zholy and Bogatyr Trans (www.bogatyr.kz).

Another major producer of coal is an international company ENCR, which consists of: Shubarkol Komir and Razrez Wostocznyj. Shubarkol Komir was founded in 2002. In October 2008 the company entered the Kazakh Stock Exchange (KASE), and in 2009 – it became a part of the Eurasian Natural Resources Corporation – ENCR. Since April 2012, ENCR owns 100% of its shares. Meanwhile, Razrez Wostocznyj operates within ENCR since October 1996 (www.enrc.com).

According to the long-term development plans for the coal industry (O koncepcji...) the largest increase coal production is expected in the mines of the Group ENCR. In 2020, coal mining companies: Shubarkol Razrez Wostocznyj Komyr and is projected to reach 20 million tons (compared to production in 2007, growth is expected to reach 13.5 million tons, i.e. by 208%).

2.3.2. The main recipients of coal on the Kazakh domestic market

The key recipient of coal in Kazakhstan is the power sector. About 85% of electricity production (data from 2010) was produced in coal power plants (i.e. 69.5 TW·h), 10% (i.e. 8.0 TW·h) was produced in hydroelectric power plants, while 6% (i.e. 4.8 TW·h) – in gas-based power plants and mazut-based power plants (Machmutwa, Achmietowa 2011). While the power sector consumes 66% of coal production, other groups of recipients include industry (18%) and municipal and household sector (16%) (Makaszowa...).

It is expected, that the coal will remain the main fuel in the energy balance of Kazakhstan. In 2015, the demand for electricity is expected to reach the level of 100 TW·h, while in 2030 – 145 TW·h. According to the Energy Sector Development Program until 2030 (Nowaja koncepcija rozwitija...), electricity production should reach 150 TW·h in order to secure further economic development of Kazakhstan. Implementation of these plans will depend on the modernization and installation of new capacities, including coal-based power plants with a total capacity of 7.2 GW, hydroelectric power plants with a total capacity of 0.7 GW and renewable energy sources with a total capacity of 3.4 GW (www.samruk-energy.kz).

2.3.3. Railway transport

When it comes to coal imports from Kazakhstan to Poland, an important role is played by rail transport. At the end of 2011, the total length of railway lines in Kazakhstan amounted to 14.9 thousand km, of which 28% (4.2 thousand miles) was electrified (Transport w Rzeczypospolitej... 2012). Almost half of the 55.9 thousand wagons (26.3 thousand units) include platforms used mainly for the transport of coal.

Hard coal (with an average market share of 41%) has a dominant share within the overall structure of cargo transported by Kazakh railways. Compared to the year 2000, coal transports in 2011 increased by 30 million tonnes (an increase of 41%) and amounted 104 million tonnes. Between 2000 and 2011, the average annual volume of coal transported by rail in Kazakhstan amounted to 88 million tonnes. For comparison, the average annual volume of coal transported by rail in Ukraine was at the level of 116 million tonnes/year, while in Russia – 273 million tonnes/year. Other important cargoes include iron and manganese ores (market share of 17%), crude oil and petroleum products (10%).

The most important railways in Kazakhstan are state-owned railways: Akcionierneje Obszczestwo Nacionalnaja Kompanija Kazachstan Temir Żoly (JSC National Company Kazakhstan Temir Zholy, KTZh). The total length of railways in operation is 14.6 thousand kilometers. KTZh handles 60% of the Kazakh transports. According to the data from 2011, more than half of the transports accounted for domestic market, while export was at the level of 35% (KTZh – Annual report 2011). Coal has a dominant share within the overall structure

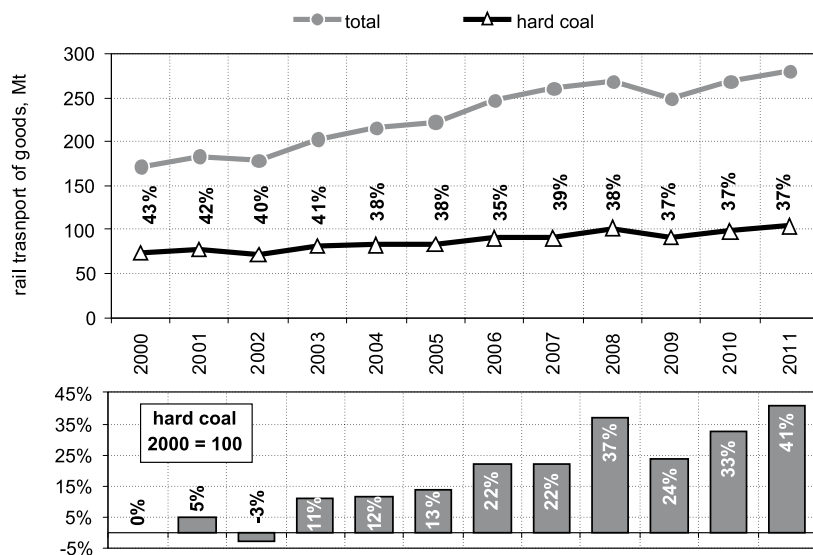


Fig. 2.26. Kazakhstan – total rail transport of goods and rail transport of hard coal, 2000–2011
Source: own work based on (Transport w Rzeczypospolitej...2004, 2008, 2012)

Rys. 2.26. Kazachstan – przewozy kolejowe towarów ogółem oraz węgla kamiennego, lata 2000–2011

of cargo (both domestic and export traffic): 39% and 45%, respectively. Domestic transports of iron (18%), crude oil and petroleum (7%) are also worth notice. Meanwhile, other exported cargoes include building materials (12%) and non-ferrous metal ores (9%).

One of the major private companies handling the transport of coal is Bogatyr Trans, while the major recipient of transported coal is the main Kazakh coal company – Bogatyr Komir. The company owns a fleet of over 4 thousand of platforms, while the average annual cargo volume is at the level of 20 million tonnes (www.bogatyrtrans.kz).

3. Railway import

The choice of a method of transport of coal from the CIS countries to Poland depends on economic factors. This applies especially to Russia, which can export coal by sea. In order to do that, coal has to be transported to the ports of the Baltic Sea. Rail distances between the producers from Kuzbass and these ports are comparable (about 4.5 thousand kilometers) to the distances to the rail border crossings of the transit countries (for example Ukraine or Belarus). However, the costs of transit are lower than the costs of maritime transport (handling, freight to the Polish ports etc.) coal exports from Russia are dominated by railway transport.

Coal imports by rail from the CIS countries between 2000 and 2011 are shown in Fig. 3.1. Since 2007, there has been a dynamic growth in imports: from 1.3 million tonnes in 2006 to 8.9 million tonnes in 2011.

When it comes to the share of imports, the supplies of coal from Russia are at a similar level (86–90%), but in terms of the volume of imported coal, Russia's dominance is increasing. For example, in 2006 Russia exported only 1.3 million tonnes of coal, while in 2011 the volume of exports increased by 6.7 million tonnes (by 518%).

Railway infrastructure allows to import coal through rail border crossings with Russia, Ukraine and Belarus (as shown in Figure 3.2). Railway distances between Kuzbass (Leninsk

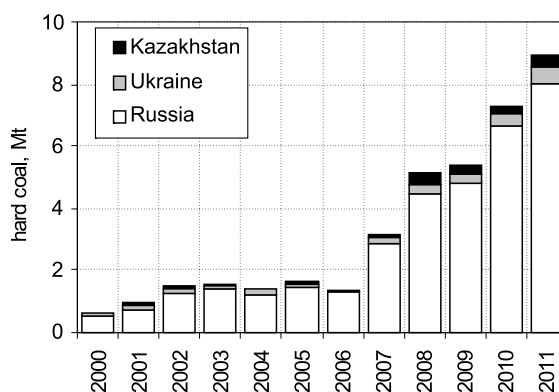


Fig. 3.1. Import of hard coal from the CIS countries to Poland, 2000–2011
Source: own work based on (Eurostat – www.epp.eurostat.ec.europa.eu)

Rys. 3.1. Import węgla kamiennego do Polski z krajów WNP, lata 2000–2011



Fig. 3.2. The main rail border crossings
Source: own work

Rys. 3.2. Lokalizacja głównych kolejowych przejść granicznych

Table 3.1

Railway distances from Kuzbass to the selected rail border crossings

Tabela 3.1

Odległości kolejowe z Kuzbasu do wybranych przejść granicznych

Poland /rail border crossing	Neighboring country	Rail border crossing	Distance from Kuzbass [km]	Transit through	Coal wagons [unit./day]
Braniewo	Russia	Mamonowo	5 100	Latvia	50
Kuźnica B.	Belarus	Bruzgi	4 800	Belarus	20
Siemianówka		Swisłocz	4 800		15
Terespol		Brześć	4 800		155
Dorohusk	Ukraine	Jahodyn	5 200	Ukraine	60
Hrubieszów		Izov	5 200		l.d.
Hrebenne		Rawa Russkaja	5 200		90
Medyka		Mostiska	5 100		215

Source: own work based on (www.warmaz.strazgraniczna.pl, www.podlaski.strazgraniczna.pl, www.nadbuzanski.strazgraniczna.pl, www.bieszczadzki.strazgraniczna.pl, www.rzd.ru, www.mirtrans.com.pl)

Kuznieckij station) and the Polish border crossings vary from 4.8 to 5.2 thousand kilometers (Table 3.1). The optimal transport route from Kuzbass (the largest coal basin in Russia) to the rail border crossing in Braniewo runs through Belarus and Lithuania, while the optimal route to Terespol – via Belarus, while the optimal route to the southern Poland – via Ukraine.

The choice of route for the import of coal to Poland is primarily determined by the transit rates (for example via Belarus or Ukraine). Although the border crossings with Ukraine have one of the highest coal-loading capacities (Table 3.1), they are not very popular. This is due to the high transfer fees, about 7–9 USD/tonne higher than in Belarus (Stala-Szlugaj, Klim 2012). This is shown by the structure of the coal rail deliveries to Poland (Fig. 3.3.) Although the presented statistics apply to the short period between 2009 and 2011, it can be seen that almost two thirds of the supplies were transported through the rail border crossings in Białystok and Kuźnica Białostocka – both bordering with Belarus.

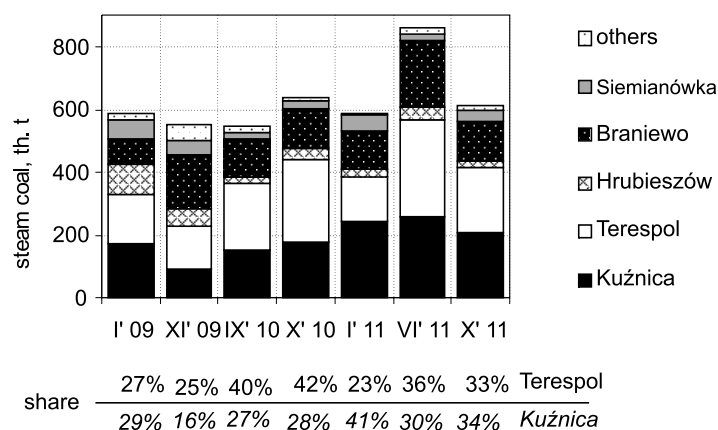


Fig. 3.3. The structure of steam coal rail deliveries from Russia (by border crossings)

Source: own work based on (Argus Russian Coal... 2009–2011)

Rys. 3.3. Geograficzna struktura kolejowych dostaw węgla energetycznego z Rosji według przejść granicznych

3.1. The share of steam coal in rail supplies to Poland

The approximate structure of rail supplies of steam coal and coking coal and shown in Figure 3.4. Steam coal has a dominant share within the overall structure of cargo transported by railways (about 89%), while it comes mainly from the following companies: KTK (about 35%), SUEK (about 29%) and KRU (about 9%) and – to a lesser extent – from the companies such as: Russkij Ugol and SDS-Ugol (Siberian Business Union, SBU) (Fig. 3.5).

KTK and SUEK have their representative offices in Poland, which will be further discussed in Chapter 5. KRU offers steam coal through an affiliated trader Krutrade AG, which has its headquarters in Switzerland (www.krutrade.com).

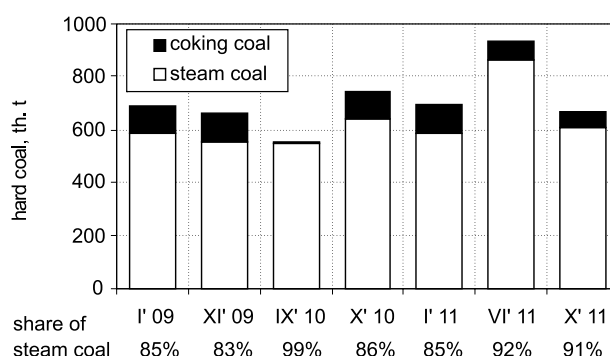


Fig. 3.4. The structure of hard coal rail deliveries from Russia during several months between 2009 and 2011
Source: own work based on Argus Russian Coal, 2009–2011

Rys. 3.4. Struktura kolejowego importu rosyjskiego węgla na przykładzie kilku miesięcy z lat 2009–2011

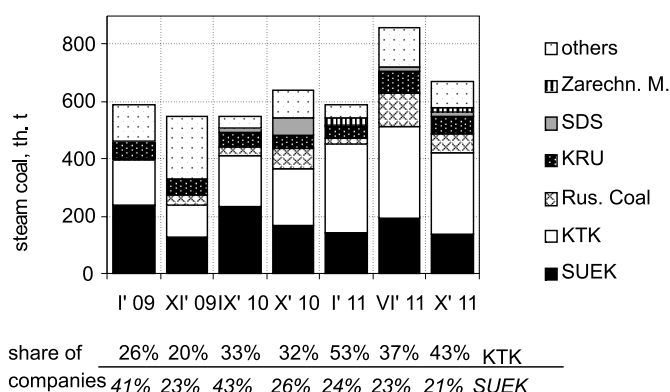


Fig. 3.5. The structure of steam coal rail deliveries (exports structure by exporters)
Source: own work based on Argus Russian Coal, 2009–2011

Rys. 3.5. Struktura kolejowych dostaw węgla energetycznego z Rosji według eksporterów

JSC Russkij Ugol (JSC Russian coal) was established in 2002. The company is specialized in the export of steam coal to Poland, Slovakia, Lithuania and Turkey. In 2011, the company exported 20% of its production (i.e. 1.4 million tonnes). JSC Russian coal also exports anthracite (231 thousand tonnes), mostly to Canada, Italy, Spain and Ukraine (Russkij Ugol – Godowej otcziot for 2011). Coal exports to Poland are dominated by railway transport.

OAO HK SDS-Ugol is a part of the holding company “Sibirsky Delovoy Soyuz” (Siberian Business Union, SBU). SDS-Ugol was founded in 2006. The company produces steam coal, coking coal and lignite. According to the data from 2011 (SDS-Ugol – Godowej otcziot za 2011) the production of coal amounted to 8.9 million tonnes. The company offers coal through an affiliated trader – MIR Trade AG (www.mirtrade.com). Recipients of steam coal and coking coal include European Union countries (such as Poland), Turkey, Morocco, USA and the CIS countries. Coal exports to Poland (both steam coal and coking coal) are

dominated by railway transport provided by Novotrans Holding Company (part of Holding Company Siberian Business Union, see Chapter 2).

3.2. The main rail border crossings

Approximate geographical structure of coal supplies from Eastern Europe is presented in Figure 3.3 shows that the most important role is played by the rail border crossings in Terespol, Białystok and Kuźnica Białostocka.

A number of cargo handling terminals near the border crossing enable the transshipment of coal from broad gauge (1520 mm) to standard gauge wagons (1480 mm). Most of them is in the hands of the PKP Cargo, including the terminals in Braniewo, Małaszewicze, Medyka and Sławków (www.pkp-cargo.pl). Another railway company – CTL Logistics – also has its own terminals near Braniewo, Kuźnica, Siemianówki, Terespol, Dorohusk and Medyka (www.cil.pl). Near the border crossing in Kuźnica/Bruzgi, the company has built the terminal for handling bulk cargo (in Bakuny, Belarus).

Barter SA (www.bartergaz.pl), the company importing coal, mineral fertilizers and liquefied gas, has own cargo handling terminals. They can be found near the border crossing in Braniewo, Sokółka (near Kuźnica) and Małaszewicze. The company is further discussed in Chapter 5.

However, it should be noted that the LHS Line (so-called the broad track), the longest Polish broad gauge railway line, is known as the westernmost station of the Trans-Siberian railway. The line (with a total length of 395 km) ends in Sławków, surrounded by a number of terminals (Stala-Szlugaj 2010). In addition to the customs services, they also enable the transshipment of coal and other cargo (wagon-wagon, wagon-car), storage, mixing, sorting and crushing of bulk.

Rail border crossing in Terespol

Railway border crossing between Poland and Belarus in Terespol (Lublin Voivodeship) – on the railway line No. 2 (Warsaw-Terespol) – is a part of the international line E20, being a part of II Pan-European Transport Corridor connecting East and West (Berlin-Moscow) (www.plk-inwestycje.pl). Rail border crossing in Terespol handles both cargo and passenger traffic (Table 3.1).

Terminal in Małaszewicze near the border crossing in Terespol plays an important role in the import of coal. In 1993, the zone of economic activity „Wolny Obszar Celny” (Customs Free Zone) has been opened in the village of Małaszewicze Małe (in the administrative district of Gmina Terespol) (www.invest.lubelskie.pl). This area has a road adapted to the heavy traffic, broad and regular gauge railway line (1435 mm and 1520 mm) and the railway sidings. There are many companies providing warehousing, car and rail transport. They organize and supervise the handling of goods and provide warehouse services (Stala-Szlugaj 2010).

Rail border crossing in Kuźnica Białostocka

Another important rail border crossing is Kuźnica Białostocka (Kuźnica Białostocka/Bruzgi border crossing point with Belarus) that supports the movement of trains and wagons (Table 3.1). The station handles the so-called Warsaw-Petersburg railway line connecting Białystok with Grodno (www.podlaski.strazgraniczna.pl). The daily volume of cargo from broad gauge wagons is 20 wagons of coal (Table 3.1). Nearby cargo handling terminals offer transshipment of goods – including coal – from broad gauge wagons to standard gauge wagons, as well as sorting and storage services (Stala-Szlugaj 2010).

According to the statistics of the Customs Chamber in Białystok, Railway Customs Office in Kuźnica Białostocka cleared 345 and 570 thousand tons of imported coal between 2010 and 2011, respectively (Siemaszko 2012a).

Rail border crossing in Braniewo

The next major rail border crossing is Braniewo-Mamonowo rail border crossing with Russia (Warmian-Masurian Voivodeship). It is located within the so-called I Pan-European transport corridor, connecting – together with Corridor IA – important centers of Western Europe with the Baltic countries and Finland (Transeuropejski...). Rail border crossing in Braniewo can handle 50 wagons of coal per day (Table 3.1). However, railway infrastructure of PKP Cargo allows to handle three trains a day. Standard handling starts after eight hours from the time of arrival (the time needed to provide an adequate number of wagons for one or two clients). This time may be significantly longer if there are several clients at the same time and the wagons are on sidings located outside Braniewo (e.g. in Chruściel, Piórkowo or Rucianka) (Siemaszko 2012c).

In addition to the customs services – they enable the transshipment (wagon-wagon, wagon-car, car-warehouse, warehouse-car/wagon) sorting, mixing, crushing and storage of coal (Stala-Szlugaj 2010).

3.3. Railway transport of imported coal

Connecting cargo handling terminals with the national railway network enables further transportation of imported raw materials into the country. According to the statistics from the Central Statistical Office (Transport – wyniki... 2005–2012), since 2004, a systematic increase in the volume of imported coal has been observed. Even in 2004, they were only 2.1 million tons, while in 2011 they increased by as much as 9.4 million tonnes. Given the share of imported coal, it amounted to 1% and 11%, respectively (Fig. 3.6).

When it comes to coal imports, the average transport distance per 1 tonne in km between 2004 and 2011 varied significantly (Fig. 3.6). The lowest was recorded in 2004, i.e. 111 km, while the highest in 2008 – 212 km. For comparison, the average transport distance per 1 tonne in domestic transport of coal was 110 and 127 km, respectively.

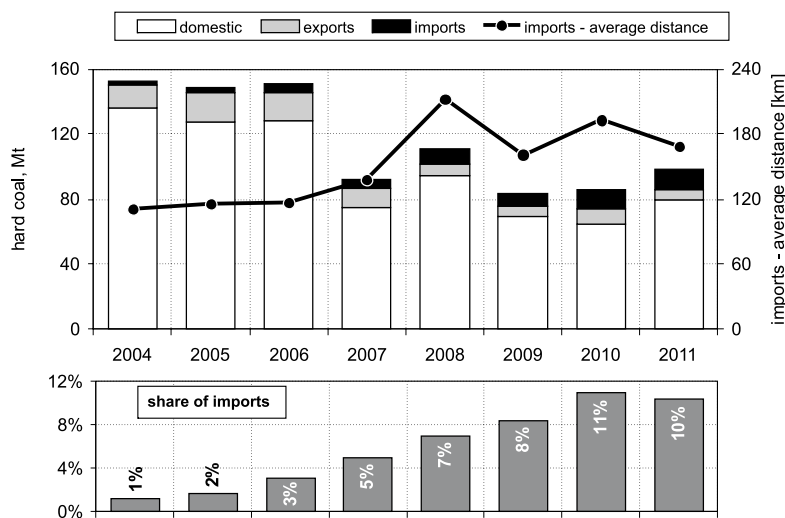


Fig. 3.6. Polish exports and imports of hard coal by standard gauge railway transport between 2004 and 2011
Source: own work based on (Transport – wyniki... 2005-2012)

Fig. 3.6. Przewozy węgla kamiennego w relacji krajowej, eksportowej oraz importowej transportem kolejowym normalnotorowym, lata 2004–2011

Polish voivodeships along the eastern border include Warmian-Masurian Voivodeship, Podlaskie Voivodeship, Lubelskie Voivodeship and Podkarpackie Voivodeship. When it comes to the collection of statistical data, non-administrative levels: regions and sub-regions, are also distinguished in addition to the administrative division of the country (GUS – www.stat.gov.pl). Such sub-division allowed to select one city – important for the statistical analysis – from each of these regions.

The distance to the nearest rail border crossing for each of these cities has been estimated. In case of the cities from the north-eastern provinces, border crossings play a pivotal role in the import of coal from the eastern direction: Terespol (Lubelskie Voivodeship), Kuźnica Białostocka (Podlaskie Voivodeship) and Braniewo (Warmian-Mazurian Voivodeship) were taken into account. In case of the Podkarpackie Voivodeship, it was the border crossing in Medyka. These distances are shown as a solid line on the graph (Fig. 3.7).

The gray area on the graph (Fig. 3.7) marks the distances that are no longer than an average transport distance per 1 tonne of imported coal (174 km for the period between 2004 and 2011).

In addition, the dotted line marks the railway distance to the nearest domestic coal producer. In this case, all eight mines representing all of the companies producing steam coal were taken into account:

- Kompania Węglowa SA – KWK Makoszowy, KWK Piast and KWK Jankowice (Makoszowy coal mine, Piast coal mine and Jankowice coal mine)
- Katowicki Holding Węglowy SA – KWK Wieczorek and KWK Wesoła (Wieczorek coal mine and Wesoła coal mine),

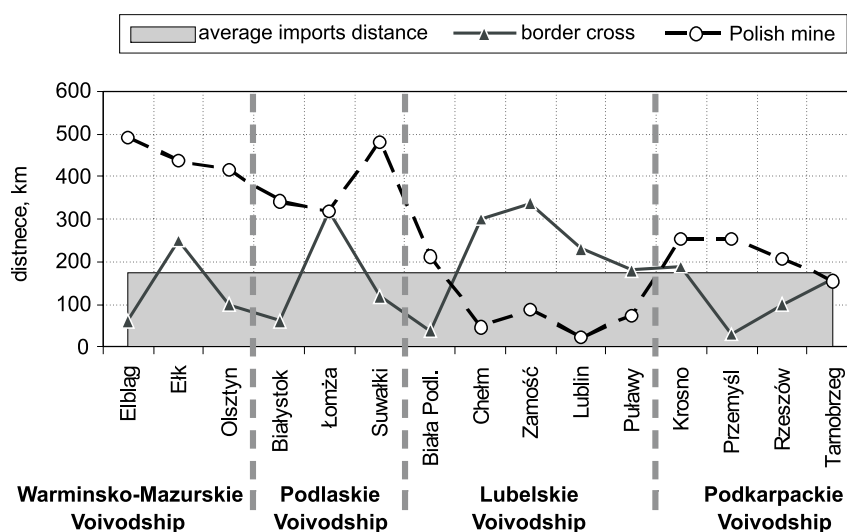


Fig. 3.7. Comparison of the distances from the rail border crossings and from the domestic coal producers to the customers in the provinces bordering with the CIS countries

Source: own calculations

Rys. 3.7. Porównanie odległości kolejowych z przejść granicznych i krajowych producentów węgla dla odbiorców zlokalizowanych w województwach graniczących z krajami WNP

- Jastrzębska Spółka Węglowa SA – KWK Krupiński (Krupiński coal mine),
- Południowy Koncern Węglowy SA – KWK Sobieski (Sobieski coal mine),
- LW Bogdanka SA (Bogdanka Coal Mine).

The Kalkulacja 2009 free software (from the website of PKP PLK) was used in order to determine the railway distances (<http://kalkulacja2006.plk-sa.pl/Kalkulacja2009/>).

The list presented above helped to prove, that the below-average transport distances per 1 tonne of imported coal occur mainly in case of the cities in the Warmian-Masurian Voivodeship and Podlaskie Voivodeship.

However, it should be noted, that the average transport distance per 1 tonne of imported coal does not give us a clear image of all of the recipients of imported coal. Most often, it presents the distances to cargo handling terminals used by major importers. Only from there – by road or rail – the coal is transported to the customers. The leading importers of steam coal are further discussed in Chapter 5.

4. Import by sea

Three-quarters of coal imported to Poland is transported by rail, while the remainder is transported by sea (see Chapter 1, Fig. 1.5).

Between 2000 and 2011 coal imported by sea came mainly from Russia (average share of 60%), while the second major supplier was the United States (approximately 20%) (Fig. 4.1).

Coal imports to Poland by sea – due to the relatively high transport costs – are mainly organized by international companies (including EDF, Electricity of France). Providing Russian raw material to their partners and affiliates allows to supply coal to Polish power plants.

The chart (Fig. 4.2) based on the statistics of the Central Statistical Office (Rocznik Statystyczny Gospodarki Morskiej, 2007–2011) aims to access the volume of imported coal. Aforementioned statistics do not distinguish steam coal and coking coal, giving a total volume from four ports: Gdańsk, Gdynia, Szczecin and Świnoujście.

The combined handling of steam coal and coking coal in Polish ports is showing an upward trend since years (Fig. 4.2). However, the transshipments of imported coal tend to vary (Fig. 4.2b): the largest – more than tripled – increase was recorded in 2008, when the imports increased by as much as 3.4 million tonnes compared to 2007. What is more,

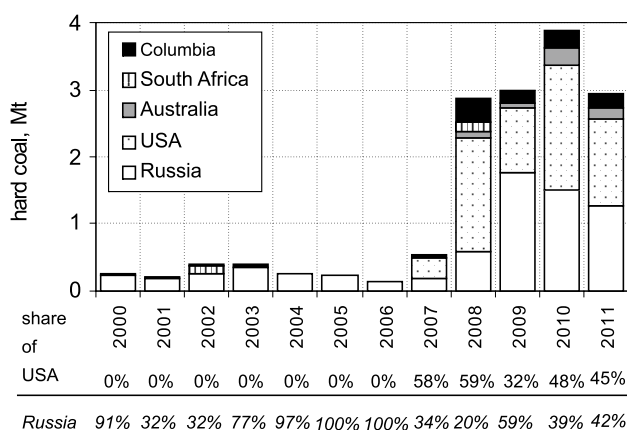


Fig. 4.1. Poland's hard coal imports by sea between 2000 and 2011
Source: own work based on (Eurostat – www.epp.eurostat.ec.europa.eu)

Rys. 4.1. Struktura morskich dostaw węgla kamiennego do Polski, lata 2000–2011

the share of the transshipments of steam coal and coking coal in the overall volume of transshipments of imported goods is increasing (Fig. 4.2c); from 1% in 2004 to up to 16%

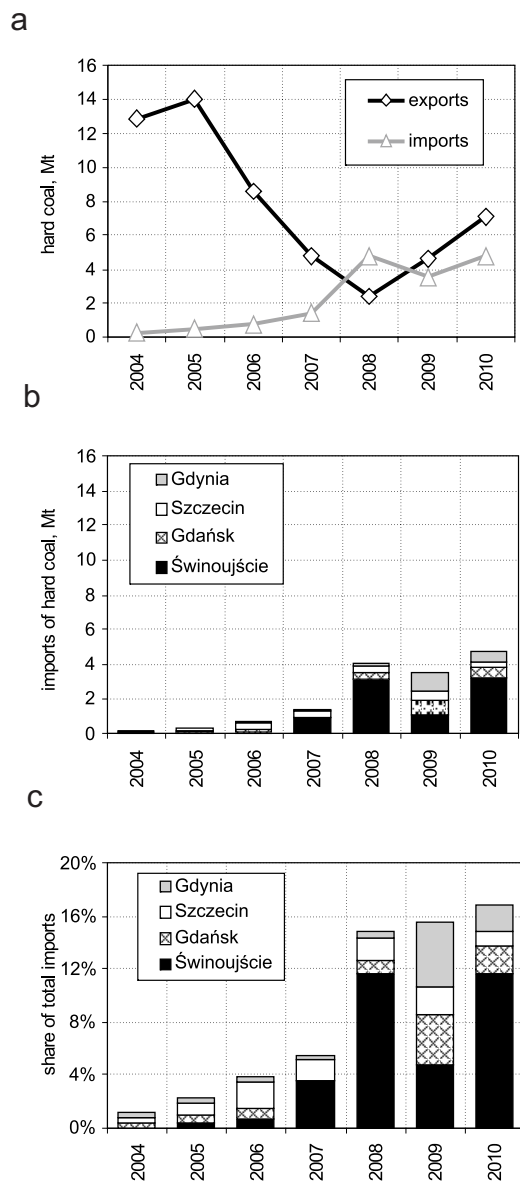


Fig. 4.2. Coal and coking coal in the maritime international trade, 2004–2010
 a) comparison of exports and imports, b) imports by port, c) share of total imports
 Source: own work based on Rocznik Statystyczny Gospodarki Morskiej (2007–2011)

Rys. 4.2. Węgiel i koks w morskim obrocie międzynarodowym, lata 2004–2010
 a) porównanie eksportu i importu, b) import według portów, c) udział w imporcie ładunków ogółem

in 2010 The port of Świnoujście is the most important when it comes to the volume of imported cargo (an average of 36% of coal imports between 2004 and 2010, while the largest volume occurred in 2010 – 69% or 3.3 million tonnes).

According to the data for the year 2011 (Siemaszko 2012b) – not yet included in the statistics of the Central Statistical Office of Poland – transshipments of coal (and coking coal) were reduced. In 2011, coal imports in the port of Gdańsk amounted to 352 thousand tons. Larger volumes – 409 thousand tonnes – were also handled in Gdynia. Meanwhile, coal handling in the ports of Szczecin and Swinoujscie also decreased. Overall (both exports and imports), they amounted to 5.4 million tonnes, which accounted for 63% of total volume of coal handled in Polish sea ports.

4.1. Logistic conditions in ports

Transshipment of imported coal takes place in the Swedish Quay (“Nabrzeże Szwedzkie”) at the port of Gdynia, in the dry bulk terminal (Terminal Suchych Ładunków Maso-

Table 4.1

Terminals handling coal in the major sea ports

Tabela 4.1

Nabrzeża realizujące przeładunki węgla w głównych portach morskich

Port name	Name		Operating company	Maximum draft	Handling of vessels	Transhipment (target)
Gdańsk	Basen Górniczy		Port Gdański Eksploatacja SA	9.10 m	Capesize	imports/exports
	Terminal węglowy		Port Północny Sp. z o.o.	15.00 m	Capesize	exports
	Terminal Suchych Ładunków Masowych (under construction)			(as planed) 15.00 m	(as planed) Capesize	imports/exports
Gdynia	Nabrzeże Holenderskie		Morski Terminal Masowy Gdynia	13.00 m	Capesize	exports/imports
Szczecin	Terminal węglowy:	Nabrzeże Gliwickie	Bulk Cargo-Port Szczecin Sp. z o.o.	9.15 m	Handysize	exports/imports
		Nabrzeże Bytomskie				
Świno- ujście	Nabrzeże Górników		Port Handlowy Świnoujście Sp. z o.o.	13.20 m	Panamax	exports/imports

Source: own work based on (www.pge.pl, www.polnocny.portgdansk.pl, www.mtmg.gdynia.pl, www.bulkcargo.com.pl, <http://phs.com.pl>)

wych, TSŁM) at the port of Gdańsk (under construction), in the coal terminal at the port of Szczecin and in the Miners Quay (“Nabrzeże Górników”) terminal at the port of Świnoujście (Table 4.1).

Transport distances are one of the most important pricing elements in the coal imports by sea. Table 4.2 summarizes the distances between the most important sea ports exporting Russian coal to Poland. Assuming that bulk carrier flows with an average speed of 14 knots, the estimated time to cover the given distance is presented. The calculation was performed with use of the following web portals (www.sea-distances.com, www.searates.com, www.ports.com). The data are ranked (in ascending order) by the rail distance between Kuzbass and a given sea port. For example, the distance between the Russian port of Ust-Luga and the port Gdansk is about 1010 km; the time needed to cover that distance is about two days, while the distance from the Kuzbass rail station to the port of Ust-Luga is 4.1 thousand kilometers.

Table 4.2

The estimated distances between the Polish ports and the Russian ports exporting coal

Tabela 4.2

Szacunkowe odległości pomiędzy portami Polski a eksportującymi węgiel rosyjski

Rail distance from Kuzbass	Port	Distance/ /Time	Gdańsk	Gdynia	Świnoujście	Szczecin	Country
3 900 km	S. Petersburg	km	1050	1040	1230	1290	Russia
		days	2	2	2	2	
4 000 km	Vysotsk	km	990	1000	1170	1230	
		days	2	2	2	2	
4 060 km	Ust-Luga	km	1010	1000	1330	1400	
		days	2	2	2	2	
4 600 km	Riga	km	590	590	810	880	Latvia
		days	1	1	1	1	
4 800 km	Ventspils	km	390	390	600	670	
		days	1	1	1	1	

Source: own work based on (www.rzd.ru, www.sea-distances.com, www.searates.com, www.ports.com)

The Port of Gdańsk

The deep-water part of the port of Gdańsk (www.portgdansk.pl) has only loading infrastructure for the handling of coal (Table 4.1). The fully mechanized coal terminal (with a daily capacity of 50 thousand tonnes and storage capacity of 600 thousand tonnes) allows the transshipment of imported coal (wagon to ship or warehouse to ship).

Meanwhile, imports of coal in the port of Gdansk are possible only in the Górniczy Basin (Basen Górniczy). Specifications of the so-called. “Internal Port” allow the handling of units with a maximum draft of 9,1 meters (Table 4.1). It is also possible to handle coal imports in the deep-water part of the port, which will further increase its unloading capacity. However, even with the present equipment, the port is able to handle twice as much cargo as now.

The Port of Gdynia

Coal and other bulk commodities in the port of Gdynia are handled primarily in the Maritime Bulk Terminal Gdynia (www.mtmg.gdynia.pl). The terminal is located at the main entrance to the port, while it also has a direct connection to the road and rail line. Import of coal is limited by the maximal draft, which is 13 m (Dutch Quay) (Table 4.1). The current equipment of Maritime Bulk Terminal Gdynia (including four weighbridges and 2 rail scales) allows to handle four times as much cargo as now.

The Port of Szczecin

The Port of Szczecin is about 68 km away from the sea (www.port.szczecin.pl). Transshipment of coal takes place in the coal terminal („Terminal Węglowy”) within the Gliwice Quay and Bytom Quay. (Baltic maritime traffic and inland barge transport to Germany). The port can handle ships with a maximum draft of 9.15 m (Table 4.1), with a cargo volume of up to about 20 thousand tonnes. It is planned to deepen the waterway to a depth of 12.5 m, which will allow to handle larger vessels. Existing storage sites and facilities to handle coal exports are adapted to unload imports. The port handles mainly steam coal imported from Russia.

The Port of Świnoujście

Located on the Baltic Sea, the sea port of Świnoujście can handle vessels with a maximum draft of 13.2 m or with a capacity of about 70 thousand tonnes (Table 4.1). In addition, a new quay is built in the external port (currently under construction), where technical depth is expected to reach 14.5 m (www.phs.com.pl). As in the port of Szczecin, storage yards and terminals handling export cargo are also adapted for handling coal imports. Thanks to its location, the port specializes in handling large liners transporting coking coal and steam coal. Świnoujście specializes in handling coal from North America, South America, Russia and Australia.

4.2. Other way of Russian import of coal to Poland

When it comes to the import of coal from Eastern Europe, waterway between Elbląg and Kaliningrad – within the Vistula Lagoon – should be taken into account. However, trading traffic at Elbląg was suspended for political reasons in 2006. In 2009, the agreement between Poland and Russia (regarding the conditions of navigation in the Vistula Lagoon) allowed the

navigation again (also for cargo barges), even though larger vessels cannot reach the open Baltic Sea (the channel belongs to Russia since 1945).

According to the statistics from the sea port of Elbląg (www.port.elblag.pl) coal handling between 2010 and 2011 amounted to 24 and 35 thousand tonnes, representing 37 and 30% of the total cargo turnover, respectively. The annual handling capacity of bulk cargo (including coal, building materials, sand and gravel) is 800 thousand tonnes. The port of Elbląg has a quay with a length of 196 m, which can handle two ships at the same time. In case of the barges, maximum length and width is 85.0 and 15.0 m, respectively. Maximum draft and load capacity are 2.3 m. and 1.2 thousand tonnes, respectively.

5. Major importers of steam coal

A number of companies involved in the import of coal were founded due to the growing interest in imported coal. When it comes to coal exports from the CIS countries to Poland, Russian and Kazakh coal producers offer their coal through affiliated traders or coal trading companies purchasing coal from leading companies.

According to (Lista Pośredniczących...) over 1,700 companies have declared “import of coal” in mid-June 2012. They could be divided into the following groups (Stala-Szlugaj, Klim 2012):

- *Polish coal producers* (LWB SA, KW SA, KHW SA, JSW SA) – as of July 2012, this group does not import coal directly (import can be imported by subsidiaries);
- *trading companies representing coal producers from the CIS countries* (e.g. SUEK Polska Sp. z o.o., representative office of the largest coal producer in Russia – OAO SUEK, KTK Poland Sp. z o.o., representative office of OAO KTK and EDW Poland Sp. z o.o., representative office of Shubarkol Komir JSC from Kazakhstan;
- *Power sector, heating industry and chemical industry* (e.g. PGNiG Termika SA, PGE Polska Grupa Energetyczna SA, DALKIA Polska SA, Energokrak Sp. z o.o./EDF Trading Sp. z o.o., TAURON Polska Energia SA, GDF SUEZ Energia Polska SA, ZA Puławy SA, Azoty Tarnów SA) – this group imports coal for its own needs. Large part of the imported coal comes from the Russian and Kazakh producers with representative offices in Poland;
- *Polish companies involved in international trade* (e.g. Węglokoks SA);
- *Large importers importing over 1 million tonnes of coal per year* (e.g. Barter SA and Krex Sp. z o.o. or Energo Sp. z o.o.);
- *medium and small importers, importing up to 0.5 million tonnes/year* (e.g. Białchem Group Sp. z o.o., Salutaris SA, UNIMOT Express Sp. z o.o., Gas-Trading SA, Lachowicz EP, MM Group, Bartex Sp. z o.o. P.H.U. Martex Holding, E100 Sp. z o.o. and others) – with the exception of Białchem Group (importing around 500 thousand tonnes per year) – the remaining companies import up to 100 thousand tonnes. Their customers are mainly from municipal and household sector. Seasonal demand for coal from this sector is the reason for irregularity of the supplies.

5.1. Russian and Kazakh coal producers

Leading companies exporting coal on the Polish market include Russian coal companies: SUEK, KTK and KRU. Compared with 2008, the total amount of coal imported from these three companies doubled in 2011 (about 3.0 million tonnes) to reach 5.8 million tonnes (Fig. 5.1).

SUEK and KTK (Fig. 5.2) consider Poland as an important market; both of them have opened their representative offices in Poland (SUEK Polska Sp. z o.o. and KTK Polska Sp. z o.o.).

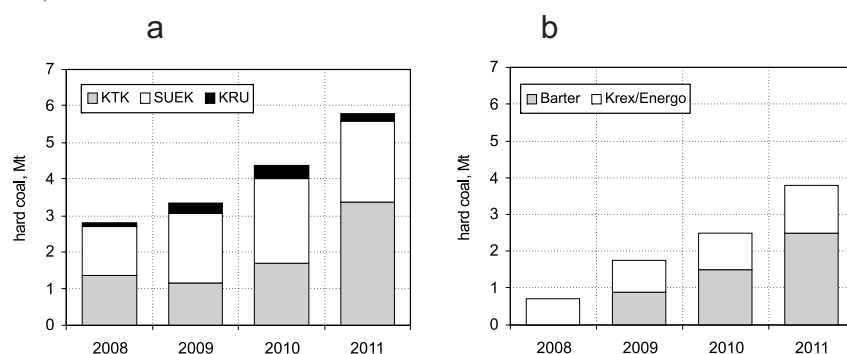


Fig 5.1. Hard coal exported to Poland, 2008–2011

a) by the Russian coal producers, b) by major importers

Source: own work based on the official data from: SUEK (www.suek.ru), KTK (www.oaoktk.ru), KRU (www.kru.ru), Barter (www.bartergaz.pl), Krex (www.krex.xom.pl), Energo (www.energobielsk.pl)

Rys. 5.1. Eksport węgla kamiennego do Polski według spółek, lata 2008–2011

a) według rosyjskich producentów węgla, b) według głównych importerów

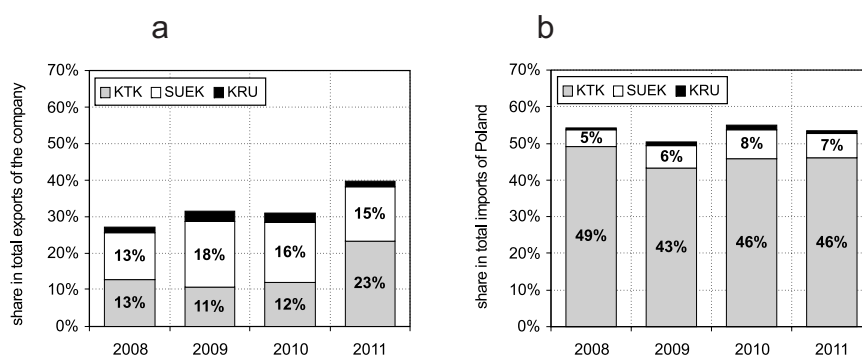


Fig 5.2. Polish coal exports by companies (KTK, SUEK and KRU)

a) the share in total exports of the company, b) the share in total imports of Poland

Source: own work based on the official data from: SUEK (www.suek.ru), KTK (www.oaoktk.ru) and KRU (www.kru.ru)

Rys. 5.2. Struktura dostaw węgla do Polski ze spółek KTK, SUEK i KRU, lata 2008–2011

a) udział w eksporcie ogółem danej spółki, b) udział w imporcie ogółem do Polski

However, it should be noted that the coal imports rely on a complex network of transactions. This “complex” structure makes it difficult to estimate the approximate volume of Russian exports from a particular coal company. According to the official data, Russia’s largest coal producers (KTK, SUEK and KRU) provided 40% of coal imported to Poland in 2011 (Fig. 5.2b). It is possible, that the remaining 60% may come from the same companies. According to the official website of KTK (www.oaoktk.ru), one of its partners is a Polish company Barter SA. According to unofficial sources, large importers of coal (like Krex and Energo) import coal produced by KRU and KTK.

SUEK Polska Sp. z o.o.

SUEK, Russia’s largest coal producer, opened its representative office in Poland (under the name of SUEK Poland Sp. z o.o.) in August 2007 (www.krs-online.com.pl). Despite the increasing amount of coal imported to Poland – an increase of 70% (i.e. 0.9 million tonnes) between 2008 and 2011 – these transports were only about 6% of SUEK’s exports between 2008 and 2011 (Fig. 5.1a, 5.2a). The coal exported by SUEK is mainly consumed by high-energy sector (e.g. PGNiG Termika Power Station – formerly Vattenfall, The Ostrołęka Power Station).

KTK Polska Sp. z o.o. (www.oaoktk.ru)

The representative office of Kuzbasskaya Toplivnaya Coal Company (KTK) in Poland, under the name of KTK Poland Sp. z o.o., was officially opened in May 2012 (www.krs-online.com.pl). For several years, Poland is its core market (the average share of exports between 2008 and 2011 was 46%) (Fig. 5.2a). Before KTK Poland Sp. z o.o. was founded, KTK offered steam coal through affiliated traders (such as Glencore International) or Polish importers including Barter SA from Białystok (KTK – Annual report 2010).

Kuzbasskaya Toplivnaya Coal Company operates three open-cast mines: Vinogradovskiy, Karakanskiy-Južny and Tsheremshanskiy, all located in Kuzbass (Fig. 5.3). These

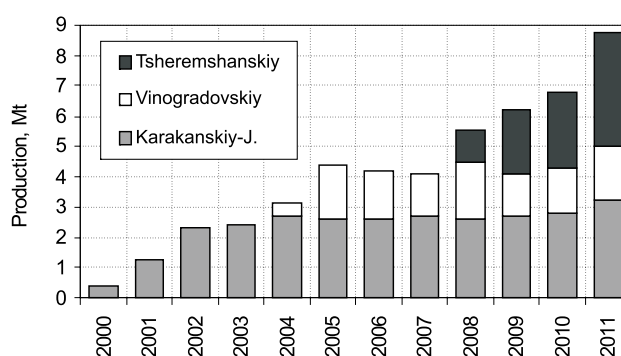


Fig. 5.3. Coal production in KTK mines, 2000–2011

Source: based on (www.oaoktk.ru)

Rys. 5.3. Wydobycie węgla w kopalniach spółki KTK, lata 2000–2011

mines have not yet reached maximum production capacity. The total designed capacity is 11 million tonnes/year (Table 5.1), while in 2011 the production was at the level of 79% (i.e. 8.7 million tonnes – Fig. 5.3).

KTK produces mainly steam coal (D type according to Russian standard: Ugli buryje... GOST-25543-88) with a maximum sulphur content of up to 0.8% (Table 5.1). The coal exported to Poland is characterized by gross calorific value of 5300–5500 kcal/kg (22–23 MJ/kg). The coal is transported by rail (from Meret – a railroad station in Kemerovo).

Table 5.1

Characteristics of KTK open-cast mines

Tabela 5.1

Charakterystyka kopalń odkrywkowych spółki KTK

Name	Vinogradovskiy mine	Karakanskiy-Južny mine	Tsheremshanskiy mine
Commissioned	2004	2000	2008
Type of coal	D	D	D
Planned production capacity [Mt/year]	3	3	5
Q [kcal/kg]	4 900–5 500	4 900–5 300	5 100–6 000
A [%]	14.5–18.2	13.2–15.2	17.2
S [%]	0.27–0.3	0.27–0.3	0.5–0.8

Source: own work based on (KTK – Annual Report 2010)

5.2. Importers importing over 1 million tonnes/year

Another major importers of coal are included in the group of the so-called large importers (importing more than 1 million tonnes per year). These include: Barter, Krex and Energo.

In 2011, they provided a total of 3.8 million tonnes of coal. These companies are importing coal from different Russian manufacturers. For example, Barter SA imports coal produced by KTK, while Krex Sp. z o.o. and Energo S.J. imports coal produced by KRU.

Barter SA (www.bartergaz.pl)

One of the leading importers of coal (among those importing more than 1.0 million tonnes of coal per year) is the Barter SA (with headquarters in Białystok). In addition to import of coal, the company is also importing liquefied petroleum gas and mineral fertilizers. Coal is imported from Russian and Kazakh coal producers.

The company focuses on individual recipients: mainly households and smaller units (e.g. small industrial plants, heating plants, schools, municipalities, hospitals, etc.). It deals with both retail and wholesale of coal (mainly for fuel depots). When it comes to the sales of imported coal, the company participates in international contracts and tenders. The average annual volume of imported coal is about 1.5 million/year (Fig. 5.1).

Barter SA has the appropriate infrastructure for the distribution of coal imported into the country. Annual handling capacity stands at 3 million tonnes of coal (with daily coal transportation capacity of 10 thousand tonnes). The company also owns warehouses with a capacity of 750 thousand tonnes.

The Company owns cargo handling terminals in Sokółka, Małaszewicze and Braniewo (capable to handle several trains at the same time). They enable direct and indirect transshipments of coal and other cargo (wagon-wagon, wagon-warehouse-car). It also has regional distribution centers, of which coal can be shipped to the customer, by car or by rail (Fig. 5.4).

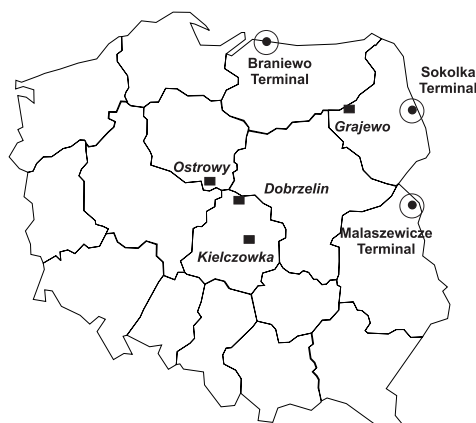


Fig 5.4. Barter – regional distribution centers and terminals handling coal
Source: own work based on (www.bartergaz.pl)

Rys. 5.4. Barter – regionalne centra dystrybucji węgla oraz terminale przeładunkowe

Krex Sp. z o.o. (www.krex.com.pl)

Krex Sp. z o.o., established in 1995, is the company importing coal (fine, medium and coarse grades) from Russia (90%) and Kazakhstan (10%). The coal is imported with use of the border crossings in Braniewo, Kuźnica, Siemianówka and Małaszewicze (Terespol). The company has its own terminals used for handling and production of coal; these include: Czuprynowo (near the rail border crossing Kuźnica/Bruzgi) and Siemianówka (near the rail border crossing Siemianówka/Svisloch) (Fig. 5.5) with a total annual handling capacity of 3 million tonnes.

In addition, it owns the network of production and transshipment terminals in the Mazowieckie Voivodeship (Ostrołęka), Kujawsko-Pomorskie Voivodeship (Janikowo),

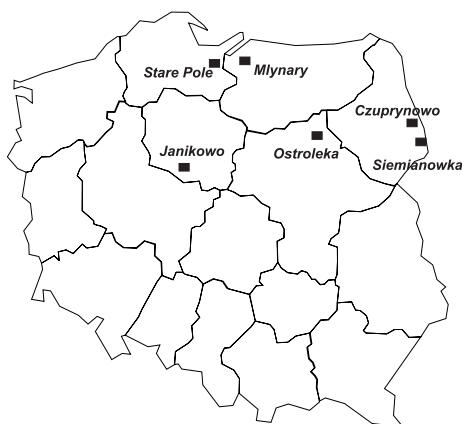


Fig. 5.5. Krex – coal handling terminals
Source: own work based on (www.krex.com.pl)

Rys. 5.5. Krex – terminale przeładunkowo-produkcyjne węgla

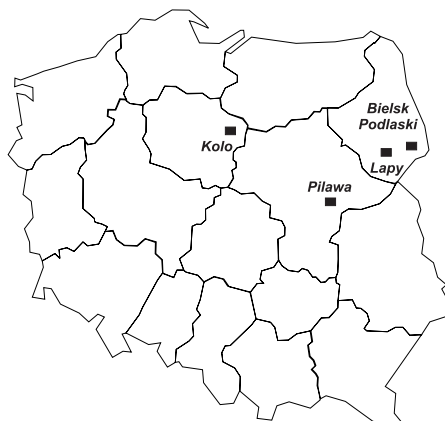


Fig. 5.6. Energo – coal handling terminals
Source: own work based on (www.energobielsk.pl)

Rys. 5.6. Energo – bazy przeładunkowe węgla

Pomorskie Voivodeship (Stare Pole) and Warminsko-Mazurskie Voivodeship (Młynary) (Fig. 5.5). Their total handling capacity is 1.2 million tonnes/year. Own network of terminals enables the distribution of coal to customers located in the center of the country.

Krex also distributes fertilizers, cement, diesel fuel and biomass.

Energo S.J. (www.energobielsk.pl)

Energo S.J. is the company importing coal from Russia. It owns four coal handling terminals located in the Podlaskie Voivodeship (Bielsk Podlaski and Łapy), Mazowieckie

Voivodeship (Pilawa) and Kujawsko-Pomorskie Voivodeship (Koło) and distributes coal to customers in the north-eastern and central Poland (Fig. 5.6). Technical and technological infrastructure allows one-time storage and processing of about 250 thousand tonnes of coal.

The annual volume of import from Energo and Krex is estimated at 1–1.3 million tonnes of coal (Fig. 5.1).

6. Estimating the cost of import of coal from Kuzbass to the Polish rail border

The previous chapters discussed transport methods (chapter 3 and 4) used by the importers (Ch. 5) importing coal from the CIS countries. This chapter is aimed to calculate the price of coal purchased from Kuzbass and exported to Poland by rail.

6.1. Steam coal prices in Kuzbass

The analysis of costs of coal imported to Poland was done under the assumption that coal will be purchased directly from the manufacturer in the Kuzbass. Internet offers (www.miner.ru) from the selected quarters of 2009 and 2011 were used.

Table 6.1

The average quality parameters of coal exported from Kuzbass, 2009–2011

Tabela 6.1

Przeciętne parametry jakościowe węgla energetycznego w ofercie eksportowej z Kuzbasu, lata 2009–2011

The Year	Q [MJ/kg]	A [%]	S [%]	
Unsorted coal				
2009	Range (usually around)	21–25 (22)	6–22 (11)	0.2–0.7 (0.3)
2010		22–26 (23)	6–17 (6)	0.4–0.7 (0.5)
2011		21–26 (22)	8–21 (12)	0.3–1.0 (0.5)
Cobble-nut				
2009	Range (usually around)	22–24 (23)	8–15 (15)	0.4–0.5 (0.4)
2010		22–26 (23)	5–15 (15)	0.3–0.5 (0.5)
2011		22–28 (23)	5–22 (10)	0.3–0.5 (0.3)
Fine grades				
2009	Range (usually around)	21–26 (22)	8–18 (11)	0.2–0.7 (0.4)
2010		21–26 (25)	11–24 (12)	0.3–0.7 (0.5)
2011		20–26 (22)	6–22 (12)	0.3–0.7 (0.5)

Source: own work based on (www.miner.ru)

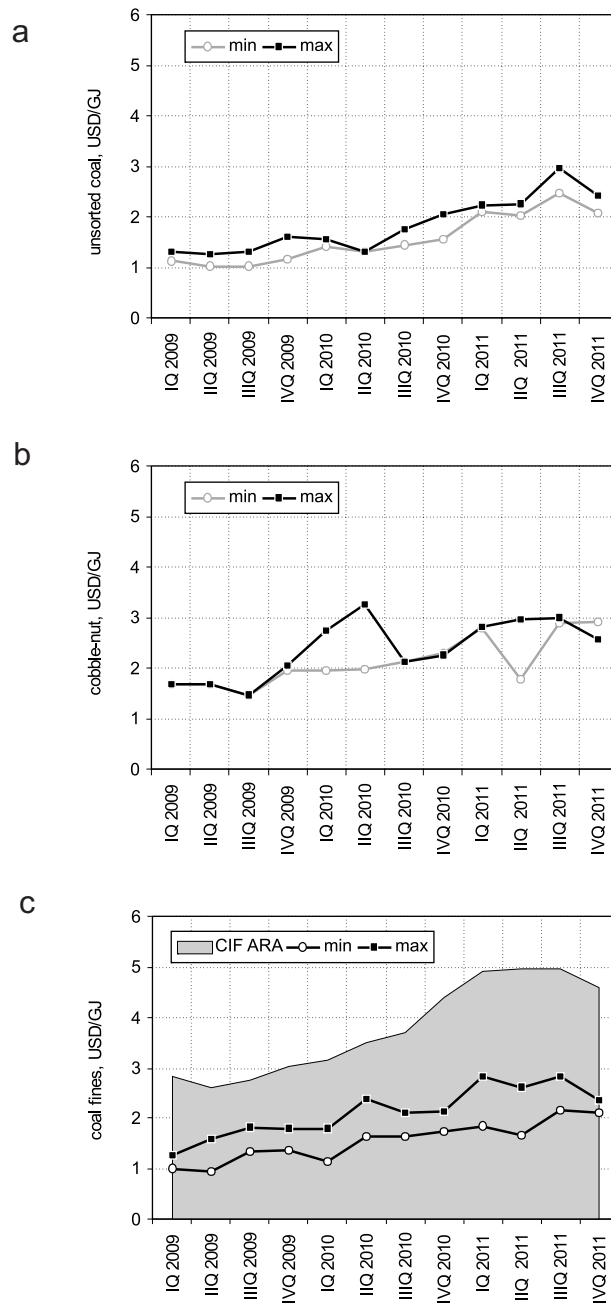


Fig 6.1. Changing prices of coal [in USD/GJ] for: unsorted coal (a), cobble-nut (b) and fine grades (c), 2009–2011

Source: own calculations

Rys. 6.1. Przebieg zmienności ofert cenowych węgla w [USD/GJ] o sortymencie: niesort (a), orzecho-kostka (b) oraz miały (c), lata 2009–2011

The coal from the CIS countries is imported to Poland in three coal grades (Stala-Szlugaj, Klim 21012): unsorted (0–300 mm) cobble-nut (25(50)–200(300) mm) and fine grades (0–50 mm). In terms of the quality parameters, coals offered between 2009 and 2011 was characterized by low content of sulphur (coal dominated row contents 0.3–0.5% S) and the average net calorific value of 22–23 MJ/kg (Table 6.1).

Exporters present coal prices expressed in U.S. dollars/tonne, which makes it impossible to compare the coals of different quality. Therefore, the prices in U.S. dollars per energy unit were converted into USD/GJ. The results are presented in Figure 6.1. The min and max lines show the range of coal prices in different quarters between 2009 and 2011.

The prices of fine grades offered in Kuzbass (Fig. 6.1c) were confronted with the offers from international markets. It was found, that the prices of fine grades offered by Russian producers changed with similar dynamics to the coal prices CIF ARA. Coal price CIF ARA is the most important indicator of European market prices (Lorenz, Grudziński 2005). CIF ARA was calculated as the average of daily quotations given in specialist journals (Argus, Platts, GlobalCoal), then it was expressed in energy units.

6.2. Cost of railway transport of coal from Kuzbass to Poland

The cost of coal imports include an important pricing element: transport costs. For this purpose, transport costs from The Kuznetsk Basin to the railway border crossings were calculated under the following assumptions:

- The coal will be transported to Poland from the railway station Leninsk Kuznetsky (Kemerovo Oblast – Kuznetsk Basin) by the Russian Railways (RZhD);
- RZhD tariffs will apply along the entire transport route – in Russia, Belarus, Ukraine and Lithuania;
- Coal will be transported in the so-called “poluwagon’s” (platforms), with a capacity of 68 tonnes.

Transport distances and railway tariffs were determined with use of the data from the official website of the Russian Railways (www.rzd.ru). The following rail border crossings were recognized as destination points: Braniewo, Kuźnica, Terespol, Hrubieszów and Medyka (Fig. 6.2). The average distance from Kuzbass to Poland is about 5.1 thousand km; the nearest border crossings are Kuźnica and Terespol (about 4.8 thousand kilometers), while the furthest is Medyka (about 5.3 thousand. miles). The train needs about 14–15 days in order to travel a distance of 5–5.3 thousand km.

Figure 6.3 summarizes the changes in the railway tariffs – for the average distance from Kuzbass to Poland (5.1 thousand kilometers) – between 2009 and 2011. These tariffs are presented in the Rubles, which is why they were converted to U.S. dollars according to the average exchange rate published by the Central Bank of Russia (CBR – www.cbr.ru).

Within the analyzed period, there were three railway tariff increases set by the Russian Railways, applicable from: 01/07/2009 (6%), 01/01/2010 (9%) and 01/01/2011 (8%)

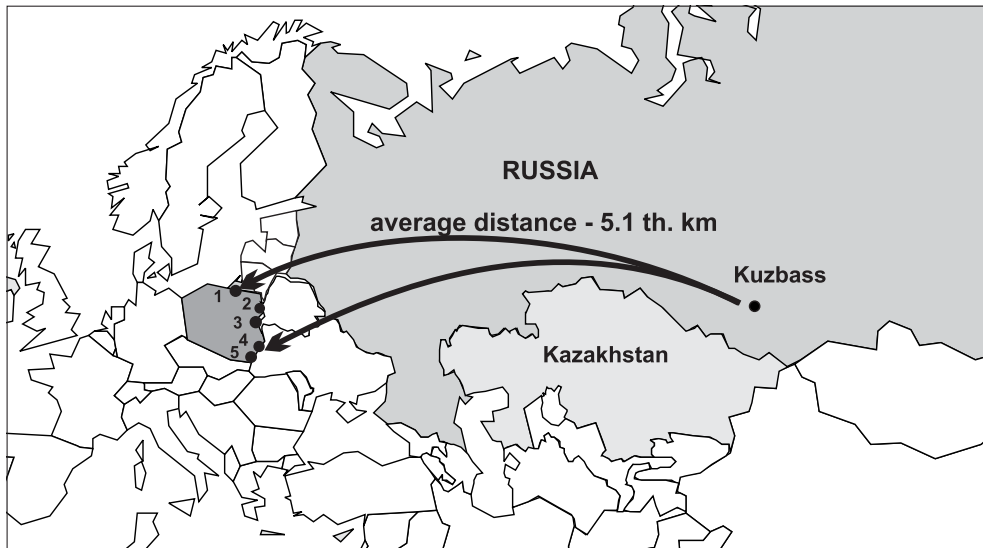


Fig. 6.2. Estimated coal transport route from Kuzbass to rail border crossings in Poland
1 – Braniewo, 2 – Kuźnica, 3 – Terespol, 4 – Hrubieszów, 5 – Medyka
Source: own work

Rys. 6.2. Orientacyjna trasa transportu węgla z Kuzbasu do kolejowych przejść granicznych w Polsce
1 – Braniewo, 2 – Kuźnica, 3 – Terespol, 4 – Hrubieszów, 5 – Medyka

(Fig. 6.3). As a result – tariffs expressed in rubles increased only three times. In contrast, the costs of transport expressed in US dollars changed every quarter (as a result of exchange rate changes). For example, the cost of transport of coal in the fourth quarter of 2010, expressed in USD/tonne, decreased compared to the first quarter of 2010 by 5%, while the cost expressed in rubles remained at the same level throughout the year.

Figure 6.4 illustrates exchange rate changes between the Ruble and the Polish Zloty against the U.S. dollar between 2009 and 2011.

The cost of transport of coal by rail from the CIS countries – including Russia – is comprised of two elements: railway tariffs in the countries participating in the transport of goods and the charges for use of wagons (Stala-Szlugaj, Klim 2012). Railway tariffs include all the charges for use of railway infrastructure and locomotives. In the CIS countries, these services are provided by the state-owned operators (The Russian Railways, RZhD, in Russia).

Meanwhile, the railway tariff is depending on whether the coal is transported from the country of the producer or is transported through transit country. An export tariff or a transit fee is applied, respectively.

The cost of rail transport of coal to Poland includes the charges for use of wagons. These prices depend on the agreement between the provider and the client.

In case of railway transport of coal in Russia, there is a constant price per wagon, while the whole train (composed of 50 wagons with a weight of 66 tonnes of coal) is taken into

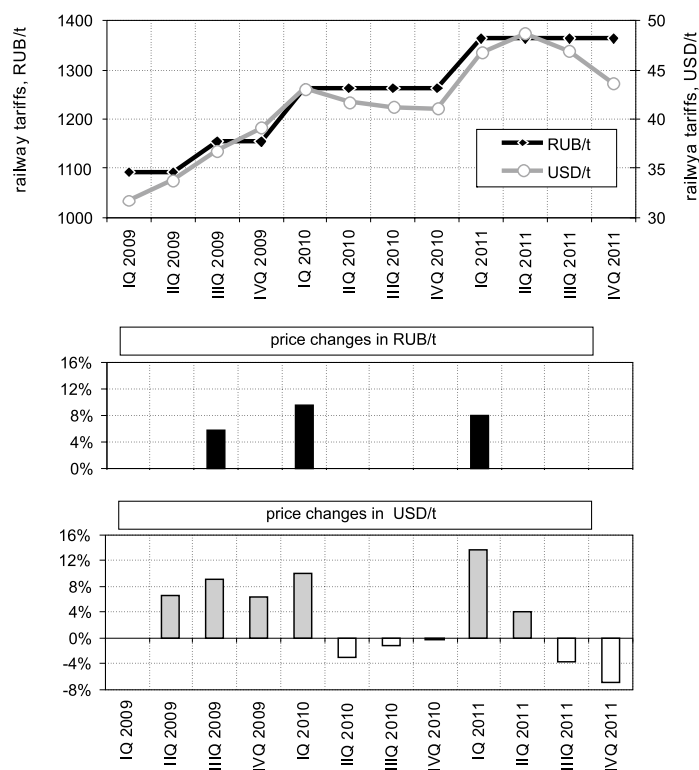


Fig. 6.3. Changes in the RZHD railway tariffs between 2009 and 2011; distance of 5.1 thousand km
Source: own calculations based on (www.rzd.ru, www.cbr.ru, www.nbp.pl)

Rys. 6.3. Przebieg zmienności stawek taryfowych RZD obowiązujących w latach 2009–2011; odległość transportowa wynosząca 5,1 tys. km

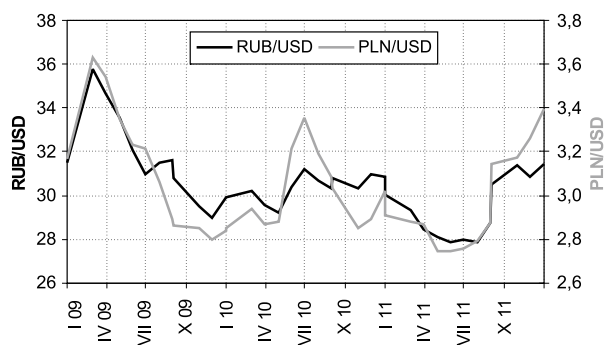


Fig. 6.4. Weighted average monthly exchange rates of the Ruble and the Polish Zloty against the U.S. dollar, 2009–2011

Source: own work based on (CBR – www.cbr.ru, NBP – www.nbp.pl)

Rys. 6.4. Średniomiesięczne ważone kursy rubla i złotego względem dolara amerykańskiego, lata 2009–2011

account. In Poland – according to the tariff of state-owned PKP Cargo – railway tariff applies to „base price for a cargo of 25 tonnes on 2-axle wagon in both domestic and international traffic" (Taryfa PKP Cargo... 2011).

In case of transportation of coal for export, Russian, Kazakh and Belarusian railways do not apply any discounts to customers (unlike, for example, PKP Cargo SA). However, railway tariffs of Russian Railways depend on the type of cargo, identified by The NHM code (Nomenclature Harmonisée Marchandises). In case of transport of coal, there is a discount of about 10% from the base price (Stala-Szlugaj, Klim 2012).

Railway distances from Kuzbass to the rail border crossings between Russia and Belarus or to the Baltic ports are comparable. Thus, the choice of a method of transport of coal to Poland depends on economic factors. With railway tariffs from 2011, rail transport through Belarus was much cheaper than the transport with use of the Baltic ports (e.g. The Port of Ust-Luga – The Port of Gdańsk). Handling coal in the port of Baltic Sea was about 10 USD/tonne; those costs alone were comparable to the cost of the transit through the territory of Belarus.

Use of such complex system of railway tariffs allows the Russian mining industry to maintain high competitiveness. The largest coal producers – thanks to special agreements signed with the Russian Railways – maintain high railway tariffs, significantly different from the standard prices. The tariff is not based on the actual route, but on the shortest distance between the mine and the delivery point (Sobel, Galemba 2006).

Coal producers might reduce the cost of railway transport of coal thanks to own fleet of wagons (Table 2.2). Some large coal companies (e.g. Mechel and SDS-Ugol) have own transport companies (Mechel-Trans and Novotrans, respectively).

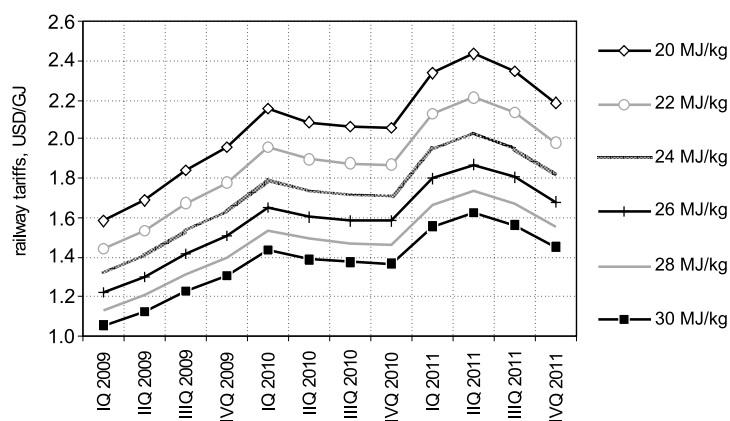


Fig. 6.5. Russian Railways railway tariffs [USD/GJ] between Kuzbass and Polish border for the given net calorific value of coal, according to the tariffs from the period between 2009 and 2011

Source: own calculations

Rys. 6.5. Stawki transportu kolejowego RZD w [USD/GJ] na trasie Kuzbas–granica Polski, dla wybranych wartości opałowych węgla, według taryfy z lat 2009–2011

The Kuzbasskaya Toplivnaya Company (KTK) occasionally provides data on the costs of coal imports to Polish rail border crossings (KTK – Annual report 2010, www.oaoktk.ru). For example, in 2010, these costs were at a level of 45 USD/tonne, while in the first half of 2011 – they were at the level of 52 USD/tonne. According to the calculations, they were 42 and 48 dollars, respectively. These differences may result from the application of Russian fees in transit countries. For example, transit fees in Belarus are lower by 7–9 USD/tonne than the transit fees charged by Ukraine (Stala-Szlugaj, Klim 2012).

From January 1, 2013, Russia, Ukraine and Belarus will introduce the so-called unified tariff and replace the existing railway tariff. Transit fees will only apply to the transports from third countries to third countries (O rieguniowanii....). The expected cost of transportation of coal from Russia or Kazakhstan to the Polish-Belarusian border will oscillate around 58–65 USD/tonne (Stala-Szlugaj, Klim 2012). Thus, it can be assumed that the main stream of coal imports will continue to be transported border crossings with Belarus (mainly Terespol and Kuźnica Białostocka).

Similarly to coal prices, railway tariffs between Kuzbass and the Polish border (5.1 thousand kilometers) in the various quarters between 2009 and 2011 have also been converted into USD/GJ. The range of net calorific values from the Table 6.1 has been taken into account. The results are presented in Figure 6.5. The calculation allows determining the costs of transport per GJ (energy unit) of coal of specified net calorific value.

6.3. Calculation of costs of coal imported from Kuzbass to Polish rail border crossings

When it comes to the grades of coal, fine grades are the dominant group in international trade. Therefore, further analysis assesses the cost of import of fine grades to Poland.

Costs of coal imports from Kuzbass to Polish rail border crossings (C_{KP}) were calculated according to the formula (1):

$$C_{KP} = \frac{C_K}{Q_i} + \frac{K_t}{Q_i} \frac{W_i}{Q_i} \text{ [USD/GJ]} \quad (1)$$

where: C_K – the price of coal (of specified gross calorific value Q_i) offered by the producer in Kuzbass [USD/tonne],

Q_i – gross calorific value of coal [MJ/kg],

K_t – costs of coal imports from Kuzbass to Polish rail border crossings (for the distance of 5,1 thousand km) according to railway tariffs applicable in given quarters between 2009 and 2011 [RUB/tonne],

W_i – calculated weighted average exchange RUB/USD applicable in given quarters of between 2009 and 2011 [USD].

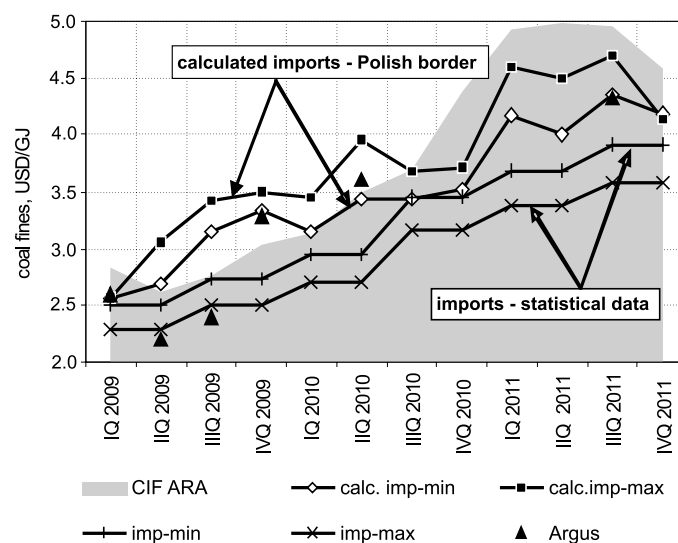


Fig. 6.6. Costs of coal imports [USD/GJ] from Kuzbass to Polish rail border crossings, quarters between 2009 and 2011
Source: own calculations

Rys. 6.6. Koszty importu węgla w [USD/GJ] z Kuzbasu do kolejowej granicy Polski, kwartały lat 2009–2011

The calculation results are presented in Figure 6.6. Similarly as in case of coal prices in Kuzbass, the lines of “min” and “max” show the oscillation range of prices of fine grades imported to Poland in the selected quarters between 2009 and 2011.

The calculated prices of coal – despite the added costs of rail transport – change with similar dynamics to the coal prices CIF ARA. Estimated costs of imports are similar to coal prices presented by the industry magazines (Argus, Platts, globalCoal).

Russian customs statistics apply to DAP (Delivered at Place) prices of fine grades with calorific value of 22–24 MJ/kg. On the graph they are shown as solid lines “imp-min” and “imp-max”. According to DAP – the seller delivers the goods to the specified point of delivery (in this case, to the border) and is responsible for both transportation costs and export customs clearance. However, the buyer is responsible for the costs and risks from the time of receiving the goods at the border (Incoterms... 2010). Compared to the prices of coal on the Polish border, the prices quoted by the Russian customs (www.customs.ru) are higher. In the period between 2009 and 2011, the calculated costs of imports (min.) were lower than the prices at the Polish border (max.) by about 0.3–0.8 USD/GJ. This could be the result of coal transport tariffs applied by the Russian state railways. The biggest price difference (about 0.8 U.S. dollars, i.e. 33%) occurred in the fourth quarter of 2009 and first quarter of 2011.

Calculated costs of coal imports were confronted with the prices of leading domestic producers of fine coal: Kompania Węglowa SA (www.kwsa.pl), Katowicki Holding Węglowy SA (www.khw.pl), Południowy Koncern Węglowy SA (www.pkwsa.pl) and LW Bogdanka SA (www.lw.com.pl). The results are shown in the Figure 6.7.

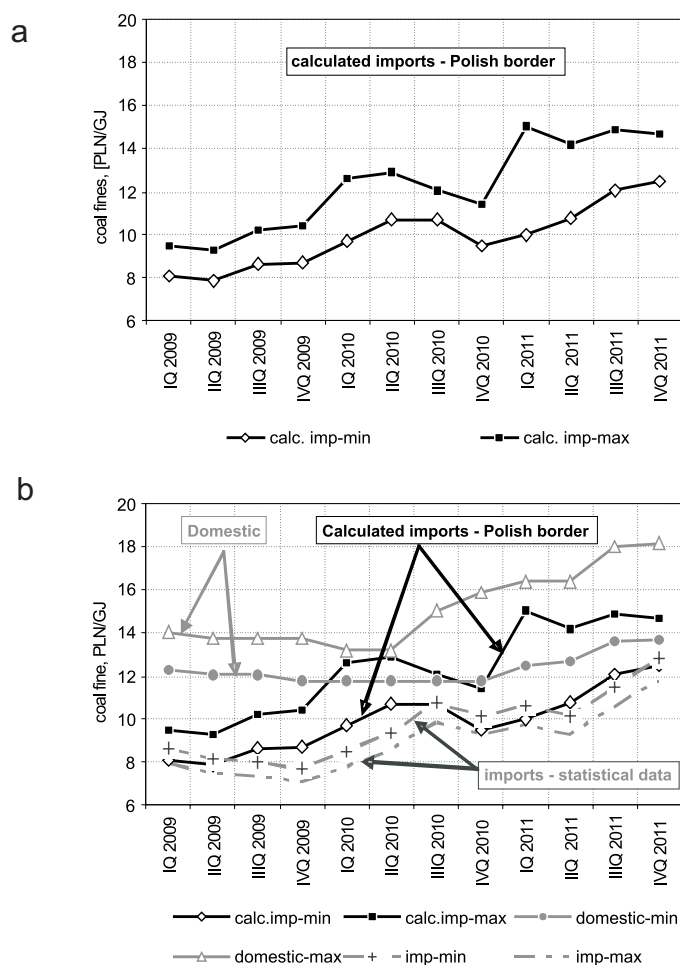


Fig. 6.7. Price Comparison of fine grades imported from Kuzbass to Polish rail border crossings (a) with the prices of domestic coal producers (b) [PLN / GJ], quarters between 2009 and 2011
Source: own calculations

Rys. 6.7. Porównanie cen miał importowanych z Kuzbasu do kolejowej granicy Polski (a) z cenami krajowych producentów węgla (b) w [PLN/GJ], kwartały lat 2009–2011

Prices of fine grades are from the official price lists published on the websites of companies selling coal to non-contractual customers. These prices (sale ex-mine) do not include excise duty and VAT. Just like the prices of Russian producers of coal, they are expressed in energy units. The calculated prices of Russian coal at the Polish border were converted into PLN according to the average exchange rate published by the National Bank of Poland (NBP – www.nbp.pl).

According to the calculations from the first quarter of 2010, imported coal is no longer competitive for domestic coal. In the first quarter of 2009, the minimum price of domestic

coal producers was higher than the maximum price of imports by 3 PLN/GJ, while in the fourth quarter of 2010 – it was higher only by 0.3 PLN/GJ and in the fourth quarter of 2012 – it was already cheaper by 1 PLN/GJ.

However, it should be noted that the final price of coal transport depends on the producer (Silesian mines or Bogdanka mine) or – in the case of imported coal – border crossing.

Summary

The uncertainty of supplies of coal from domestic producers in 2007 was the reason why the imports of coal from Eastern Europe were implemented on a massive scale. This was met with a great interest from the Russian producers and exporters of coal due to the prevailing trends in the global coal markets. Between 2008 and 2009, as a result of the ongoing global financial crisis, coal market entered a long-term period of stagnation. As part of the savings plan, Europe reduced the production of electricity. Thus, the reduced possibility to sell this product was a big problem for many exporters. In addition, the exchange rate of national currencies against U.S. dollar meant that import has become very cost-effective. According to national statistics, coal imports increased from 5.8 million tonnes in 2007 up to 10.8 million tonnes in 2009 (i.e. by 87%). Regarding steam coal, they increased to 144% (from 3.5 million tonnes in 2007 to 8.6 million tonnes in 2009).

Russia is the most important exporter of steam coal to Poland. Between 2006 and 2011, Russia provided a total of 75% of imports. Other leading exporters include: the Czech Republic, Ukraine and Kazakhstan. Therefore, the CIS countries play an important role in the import of raw materials. During these six years, Russia, Ukraine and Kazakhstan have provided an average of 75% of coal imports.

In terms of the grades of coal, Russia, Kazakhstan and Ukraine are exporting: fine grade (0–50 mm) cobble-nut (25(50)–200(300) mm) and unsorted coal (0–300 mm). From the point of view of the quality parameters, supplied coal was characterized by low sulphur contents (average: 0.3–0.5% S). Typical values of net calorific value for fine grade were oscillating around 22–24 MJ/kg, while for the cobble-nut they were around 23–25 MJ/kg.

About three quarters of coal imported to Poland is transported by rail, while the remainder – by sea. Coal is imported mainly from the largest coal basin in Russia – Kuzbass. Average transport distance to the rail border crossings in Poland is 5.1 million kilometers. The closest (in a distance of about 4.8 thousand kilometers) include rail border crossings with Belarus: Terespol, Białystok, Kuźnica Białostocka and Siemianówka, while the farthest (about 5.2 thousand kilometers) include border crossings with Ukraine: Dorohusk, Hrebennie and Hrubieszów. Between 2009 and 2011, the coal was imported mainly through Terespol and Kuźnica.

In case of imports by sea, imported coal is handled at four ports: Gdańsk, Gdynia, Szczecin and Świnoujście. Technical parameters in the first three ports allow handling Baltic

shipping routes, while the technical parameters in the latter allow handling transatlantic shipping routes.

Among the companies involved in the import of coal, following groups can be distinguished:

- Polish coal producers,
- trading companies representing coal producers from the CIS countries,
- power industry, heating industry and chemical industry;
- Polish companies involved in international trade,
- large importers importing annually over 1 million tonnes of coal,
- medium and small importers importing annually to 0.5 million tonnes of coal.

The leading role is played by two groups of coal importers: companies representing Russian and Kazakh coal producers and the group of large importers (importing annually over 1 million tonnes).

The first group is represented by: SUEK Poland (representing Russia's largest coal producer – SUEK), KTK Poland (representative of the Russian company OAO KTK) and EDW Poland (representing Kazakh mine Shubarkol Komir). This group focuses primarily on the supplies to large customers (mainly from the power sector). Meanwhile, the companies from the second group: Barter, Krex and Energo – focus their attention on individual recipients.

In comparison with other European coal customers, Poland is an attractive importer not only because of relatively “short” distance from the major Russian mining centers. Another contributing factor is the possibility to transport coal by rail. Transport cost is a well-known pricing element – in addition to production costs and the exchange rate of the national currency against U.S. dollar – in the import of coal. Between 2009 and 2011, the calculated costs of rail transport of coal from Kuzbass to Poland, expressed in U.S. dollars, were around:

- 32 to 39 USD/tonne in 2009,
- 41 to 43 USD/tonne in 2010,
- 44 to 49 USD/tonne in 2011.

The analysis of the costs of coal imports (including the individual quarters between 2009 and 2011), assuming that it will be purchased directly from the manufacturer in Kuzbass and transported to Poland with use of rail, has been done. Costs of imports of fine grade (expressed in Polish Zloty) were at the following levels:

- 7,9–10,4 PLN/GJ in 2009,
- 9,5–12,9 PLN/GJ in 2010,
- 10,0 – 15,0 PLN/GJ in 2011.

The calculated cost of coal imports were confronted with the offer of domestic coal producers, delivering coal to non-contractual customers. Taking into account the price on the domestic market, imported coal was found to be no longer competitive since the first quarter of 2010. What was the reason behind the attractiveness of the price of imported raw material? Coal consumers could choose from the three main sources of supply: Silesian mines, Bogdanka mine and imported coal. For example, if all three providers offered the same price,

the final price depended on the cost of transport: from Silesia, from Bogdanka mine and from the border crossing station. Therefore, in case of the Voivodeships located in the north-eastern Poland – imported coal was considerably cheaper. If the price of imported coal was lower than offered by domestic manufacturers, these differences were even bigger.

Because of more stringent emission standards applicable from 2016 (Rozporządzenie Ministra Środowiska z dn. 22 kwietnia 2011...), the demand for low-sulphur and low-ash coal will increase. The companies exporting coal can take advantage of this situation – especially the companies from the CIS countries, as the average parameters of their coal are (as received): 0.2–0.7% S_t^r (sulphur) and 3–15% A^r (ash content).

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Polish imports of steam coal from the East (CIS) in the year 1990–2011

Abstract

For several years, domestic steam coal customers – both power plants and municipal and housing sector – are facing offers from both local and foreign producers.

As a result of increasing coal imports, a number of questions concerning the origin and the quality of this raw material and the companies involved in the process. Other important issues include the transport mode, competitiveness of prices of imported coal, etc. Therefore, this monograph aims to systematize the knowledge on coal imports.

The first chapter discusses the situation of domestic mining industry between 1990 and 2010. It presents the production and demand for coal, while a particular attention is paid to the years 2006–2007. The chapter presents the variability in quality of imported coal and estimates the structure of imported coal in terms of coal grades.

The second chapter focuses on the major exporters of coal. Particular attention is paid to Russia, Ukraine and Kazakhstan, because about 86% of imported coal comes from these countries (2006–2011). The chapter provides information about resources, production and export of coal for each of the three countries. It also discusses the reforms of the coal industry. Particular attention is given to Russia, due to its leading share in imports of coal. In the period between 2006a and 2011, it stood, on average, at 75%.

Different methods of transport used to import coal are discussed in the third (imports by rail) and fourth (imports by sea) chapter. Particular attention is paid to imports by rail, because nearly two thirds of coal imported to Poland is transported with use of railway transport. The chapter presents the approximate geographical structure of coal rail deliveries (by border crossings). What is more, the chapter includes the approximate structure of the companies exporting coal to Poland. Regarding coal imports by sea, the fourth chapter discusses logistical conditions of Polish sea ports.

The fifth chapter characterizes the major companies exporting coal to Poland. Special attention is paid to Russian and Kazakh coal producers, which have their representative offices in Poland, and to the companies exporting more than 1 million tonnes per year.

The last chapter is an analysis of the cost of coal imports, assuming that it will be purchased directly from the manufacturer in Kuzbass and transported to Poland with use of rail. The analysis included the individual quarters between 2009 and 2011. Due to the fact

that the cost of rail transport is an important pricing element in coal imports, transport costs for the average distance from Kuzbass to Polish rail border crossings from the various quarters between 2009 and 2011 were presented. The resulting cost of coal imports was confronted with the prices of domestic coal producers delivering to non-contractual customers.

Import węgla kamiennego energetycznego do Polski z kierunków wschodnich w latach 1990–2011

Streszczenie

Od kilku lat krajowi odbiorcy węgla energetycznego – zarówno z energetyki zawodowej, jak również sektora komunalno-bytowego – spotykają się z ofertą rodzimych producentów oraz surowca pochodzącego z importu.

Wobec rosnącego importu węgla do Polski pojawiło się szereg pytań związanych: ze źródłem pochodzenia węgla, jakością sprowadzanego surowca, firmami zajmującymi się jego importem, udziałem rodzajów transportu w sprowadzaniu węgla, konkurencyjnością cenową wobec surowca polskiego etc. Dlatego – wobec gromadzących się licznych pytań – w niniejszej monografii postanowiono usystematyzować wiedzę na temat importu węgla.

Rozdział pierwszy poświęcono omówieniu sytuacji krajowego górnictwa w latach 1990–2010. Przedstawiono produkcję oraz zapotrzebowanie na węgiel, zwracając szczególną uwagę na lata 2006–2007. Pokazano zmienność parametrów jakościowych sprowadzanego węgla. Oszacowano również strukturę importowanego surowca pod względem sortymentowym.

W drugim rozdziale skoncentrowano się na omówieniu głównych eksporterów węgla. Szczególną uwagę poświęcono Rosji, Ukrainie i Kazachstanowi, gdyż łącznie z tych trzech państw (lata 2006–2011) pochodzi średnio 86% importu węgla energetycznego. Dla każdego kraju przedstawiono informacje o zasobach, produkcji oraz eksporcie węgla. Omówiono również reformy górnictwa węgla. Szczególną uwagę poświęcono Rosji, ze względu na jej wiodący udział w imporcie węgla do Polski, który w latach 2006–2011 średnio kształtował się na poziomie 75%.

Z uwagi na rodzaj wykorzystywanego transportu w imporcie węgla, rozdział trzeci i czwarty poświęcono omówieniu odpowiednio: importu drogą kolejową oraz drogą morską. Większą uwagę poświęcono importowi drogą kolejową, gdyż blisko 2/3 sprowadzanego surowca trafia do Polski koleją. Przedstawiono przybliżoną geograficzną strukturę kolejowych dostaw węgla pod względem przejść granicznych. Pokazano również orientacyjną strukturę spółek eksportujących ten surowiec do Polski. Odnośnie importu węgla drogą morską omówiono uwarunkowania logistyczne polskich portów morskich.

W rozdziale piątym scharakteryzowano głównych importerów węgla na rynek Polski. Wyodrębniono grupy importerów odgrywających istotną rolę w imporcie tego surowca.

Szczególnie skupiono się na rosyjskich i kazachskich producentach węgla, posiadających swe przedstawicielstwa w Polsce oraz na spółkach sprowadzających rocznie powyżej 1 mln ton.

W ostatnim rozdziale przeprowadzono analizę kosztów importu węgla zakładając, że zostanie on zakupiony bezpośrednio u producenta w Kuzbasie i sprowadzony do Polski transportem kolejowym. Analizą objęto poszczególne kwartały lat 2009–2011. Ze względu na to, że koszty transportu kolejowego są istotnym elementem cenotwórczym w kosztach importu węgla, dla średniej odległości z Kuzbasu do kolejowej granicy Polski zaprezentowano zmienność stawek transportowych obowiązujących w poszczególnych kwartałach lat 2009–2011. Otrzymane koszty importu węgla skonfrontowano z cenami krajowych producentów węgla skierowanego do odbiorców pozaumownych.