

Russian coal sector

Draft findings of ENERPO's project on energy transition in Russia

March 2021



Agenda

- The main stages of the Russian coal industry transformation
- The significance of coal for the Russian economy
- Coal industry risks review
- Coal competitiveness analysis
- Possible scenarios of the Russian coal industry further development
- Technological progress opportunities



1. The historical stages of the Russian coal industry

In 1989, the crisis began in the coal industry. It provoked a massive strike movement of miners.



1991

The collapse of the USSR

A general decline in industrial production. The Russian economy began restructuring to a market system.

The final stage of the industry privatization. The Russian coal industry emerged from crisis.

1999-2006

The economic crisis.

2014-2016

1960s

1980s



1992-1998

The World Bank allocated more than US \$ 1.1 billion to liquidate unprofitable mines.

2008

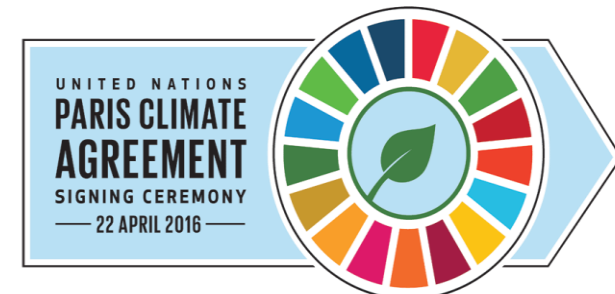
Another economic crisis.

2019

Russia ratified the Paris Climate Agreement.

The level of coal domestic consumption began to decline gradually from 54% in 1960 to 25.2% by 1980.

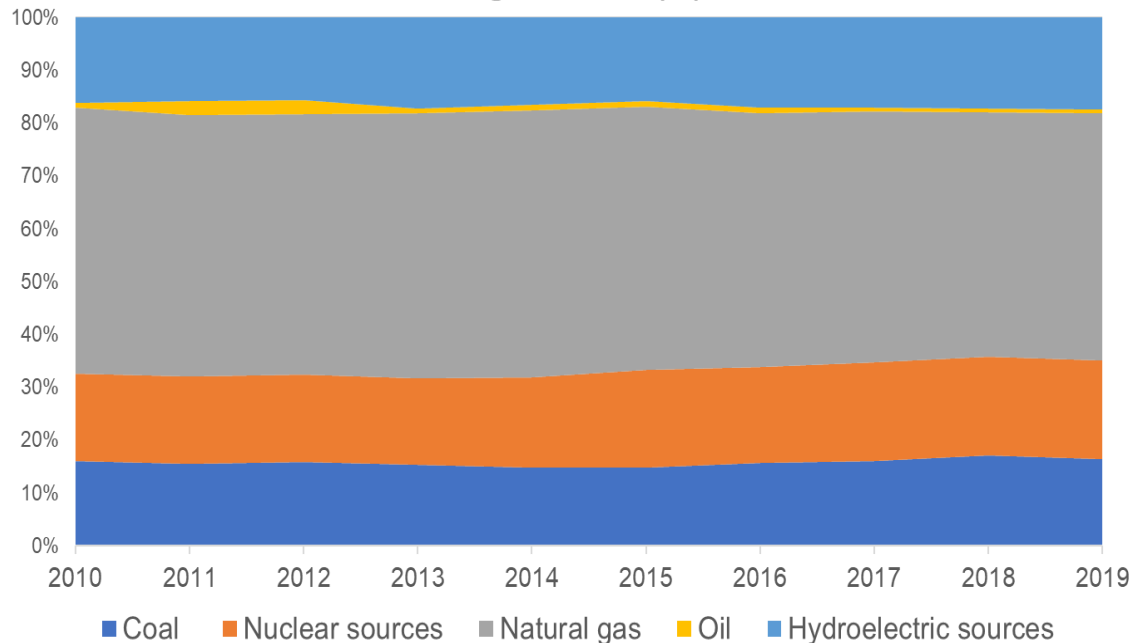
In 1983, the «Energy Program of the USSR for the Long Term» was adopted, an intensive increase in coal production began. High production indicators were achieved due to opencast coal mining.



2. The significance of coal for the Russian economy

Coal in energy balance (2019)

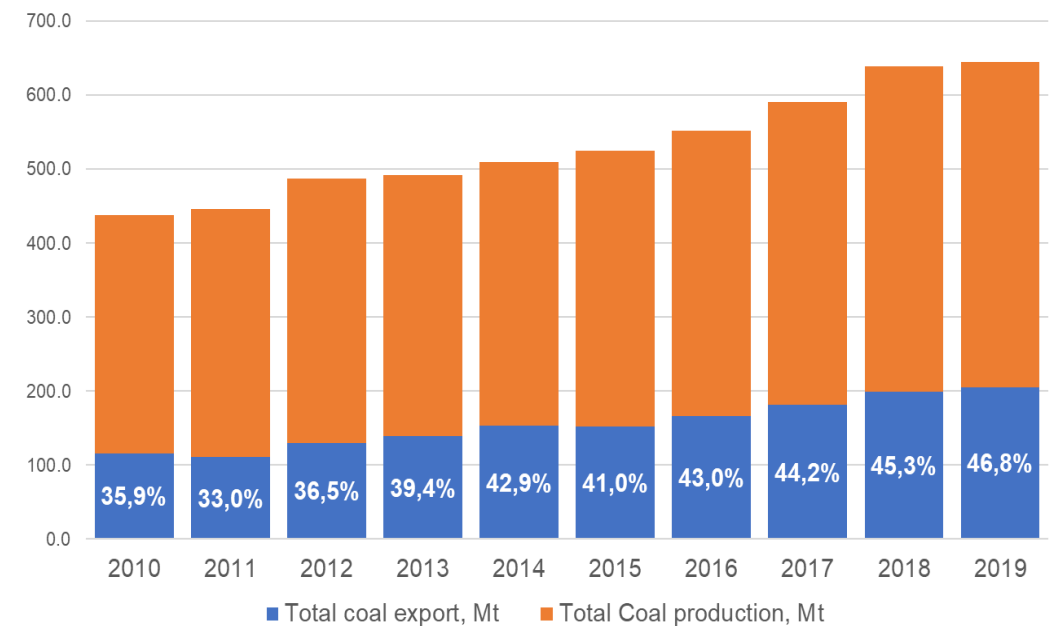
The structure of energy consumption for electricity generation (%)



- Coal 17.44% (+1.45% to 2010)
- Nuclear 20.02% (+3.57% to 2010)
- Natural gas 49.82% (-0.42% to 2010)
- Oil 0.6% (-0.23% to 2010)
- Hydro 18.62% (+2.55% to 2010)

Coal export/domestic use (2019)

The share of coal export in total production (%)



- Total coal production (Mt) **439.2** (+117.2 Mt or +36.39% to 2010)
- Total coal consumption (Mt) **254.7*** (+33.6 Mt or +15.24% to 2010)
- Total coal export (Mt) **205.4** (+89.7 Mt or +77.5% to 2010)



2. The significance of coal for the Russian economy

Table 1. Russia's energy production and consumption, 2019

Energy Source	Production, con. units	Consumption, con. units	Share of GDP*, %	World share, %	World share <u>2019/2018</u> , %	CO ₂ ** mln tons	Share of Total World CO ₂ emissions, %
Oil, mln tons	568.1	165.1	15.58%	12.70%	+0.63%	1704.3 / 495.3	4.99%
Natural gas, bln m ³	679.0	444.3	8.18%	17.00%	-0.30%	1256.1 / 821.9	3.68%
Coal, mln tons	441.4	202.4	1.29%	5.50%	static	1235,92 / 566.72	3.61%

*calculated as the total volume of the type of fuel produced at average market prices on the international market

**estimated price on coal is taken for \$50

***calculation of CO₂ emissions from combustion of various types of fossil fuels (production / consumption)

Source: calculations based on BP Statistical Review of World Energy 2020, CDU TEK 2019, Rosstat 2019 and National report of the Russian Federation on the inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not regulated by the Montreal Protocol for 1990–2010.

As of **2019** coal exports amounted to:

- **205.4 million** tons of coal
- it provided the Russian economy with about **\$16 billion** in foreign exchange earnings
- Russian coal companies transferred **100 billion rubles** in tax payments to the state budget (or approx. **\$1.5 billion**).



3. Coal industry risks review

Transition risk factors

- 1) Energy and climate policies
- 2) Consumers' preferences
- 3) Technologies

Economic costs

- 1) Assets impairment
- 2) Unemployment
- 3) Enterprises, households and government's revenue losses

Possible risks for the financial sector

- 1) Equity investors' portfolio losses
- 2) Higher loan default ratios for banks
- 3) Higher pay – outs and portfolio losses for insurance companies
- 4) Decline in returns

Macroeconomic risks

- 1) Government (budget deficit, higher cost of debt, risk of default)
- 2) Companies (lower investments, lack of external finance, bankruptcy)
- 3) Households (lower consumption, lower investments, overindebtdness)

- Transition to low-carbon economy is considered in Russia as real threats to the loss of a significant part of the country's income (**about 25% of GDP**) from the export of hydrocarbons (*the previous slide*);

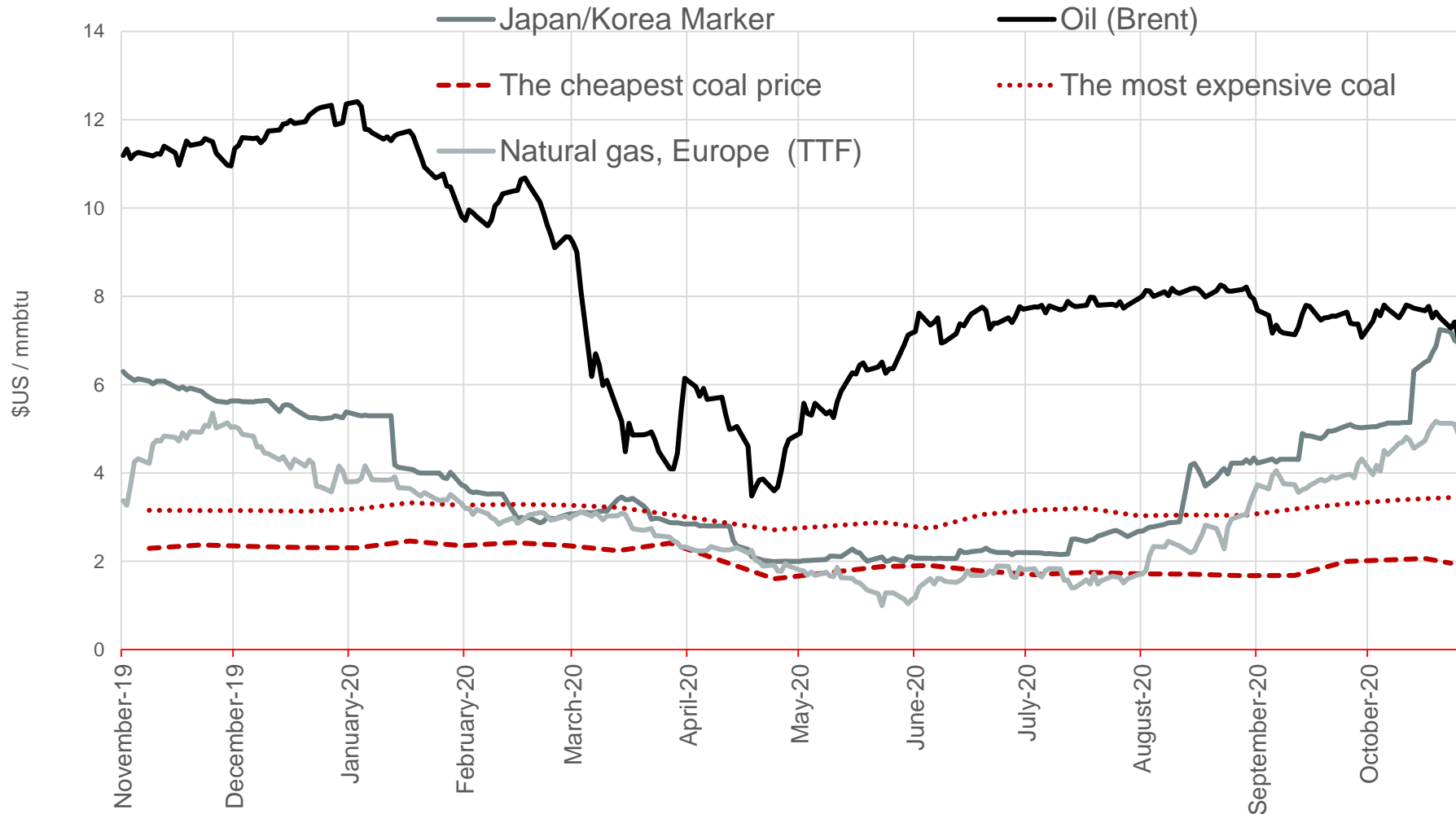
- **CBAM is the serious challenge for the Russian coal industry.**

From the moment the CBAM is introduced, which according to plan is to happen in 2022, the Russian economy may lose over EUR 50 billion by 2030.

According to those calculations, the costs Russian companies will have to incur are somewhere between EUR 3 and 4.8 billion a year.



4. Coal competitiveness analysis



Source: Thomson Reuters

FINDINGS:

Positive

- Lower price among energy sources
- Lower price volatility
- Steady demand
- Export diversification
- Infrastructural constraints

Negative

- Low investors attractiveness
- High carbon risks for the industry



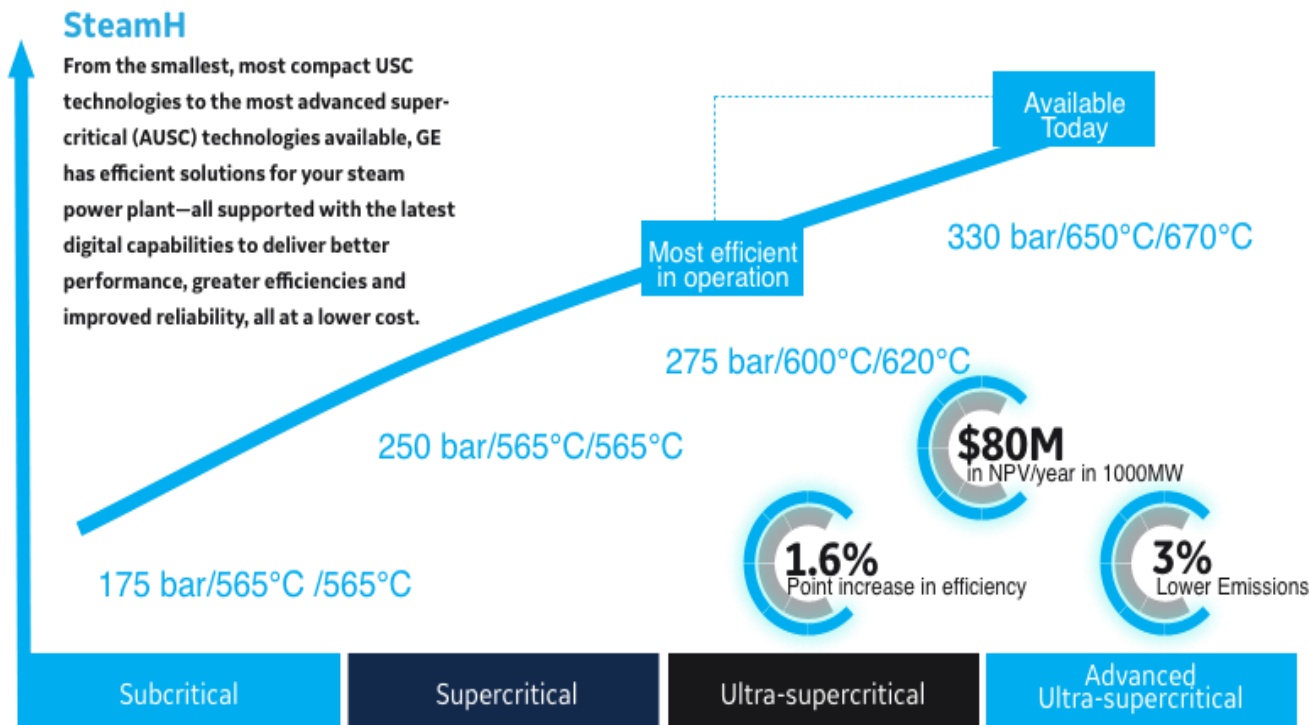
5. Possible scenarios of the Russian coal industry further development

Table 2. The 3 scenarios and their assumptions

Business as usual (BAU)	If the level of demand and the world price for coal enables the industry to remain profitable, the capacity of transport infrastructure will be the main bottleneck for increases in coal production. In this scenario, tariff and non-tariff barriers for coal transportation and exports are the only factors crucial for industry development.
Demand decreases due to the global low-carbon energy transition.	If the pace of global energy transition to low-carbon energy sources accelerates, there will be a drop in demand for coal from the main coal importers. Industrial production of coal products will begin to decline, and the coal industry will be at risk. The crisis will lead to the closure of enterprises with the highest cost of production, specialized in the exclusive extraction and processing of coal. Companies will need to adapt and implement clean coal technologies.
Demand in the Asia-Pacific compensates for low-demand from the main importers.	Demand for coal in the Asia-Pacific region will allow coal companies to fully compensate for decline in sales of coal to the Western exporters. New markets in developing countries in Asia and North Africa will be the main driver of growth. Under this scenario, a sharp increase in demand for Russian coal imports from India is expected.



6. Technological progress opportunities



* For a 1000MW base plant in Asia, this is an economic benefit of \$80M in additional value for our customers.

Source: General electric web site
(<https://www.ge.com/power/steam/steam-power-plants/advanced-ultra-supercritical-usc-ausc>)

- **Ultra-Supercritical & Advanced Ultra-Supercritical Technology** raises the bar on coal plant efficiency
- Carbon capture, utilisation, and storage (CCUS)
- Power plant filtration technologies
- Coal liquefaction and gasification
- Closed coal handling and transshipment
- Coal mines automatization and mining digitalization
- Methane production from coal beds



Key findings

- Private and competitive sector that went through many crises and reforms
- Independent companies with no unified strategy for further development
- The future of the industry depends on transport infrastructure for export
- Domestic clean coal technologies are not available
- There is no alternative to traditional use of coal in Russia



Thank you

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This project is a collaboration between Climate Strategies, European University at St.Petersburg (EUSP), Fridtjof Nansen Institute (FNI) & Higher School of Economics (HSE)

<https://climatestrategies.org/projects/russian-coal-sector-transition/>

