



The Role of Coal in the International Energy Trade

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Abstract: Review of the second edition of the book by Lars Schernikau. *Economics of the International Coal Trade: Why Coal Continues to Power the World*. Springer, 2016. 497 p.

Key words: international coal trade, world coal market, coal gasification, shale oil and gas, environmental pollution

The first 2010 edition of the “Economics of the International Coal Trade”, subtitled “The Renaissance of Steam Coal” reflected a revival of the world coal market in 2006 – 2008. The second edition describes new historical period in coal industry influenced by shale gas revolution and increased attention towards climate change and sustainable development.

Despite the title of the book almost half of the content describes technical issues: mining, technological features of coal production and processing, coal sampling and analysis, coal preparation, modern global political environment, etc. This material also provides relevant data on innovative technologies. L. Schernikau analyzes in detail technologies for converting coal into liquid fuel, GTL (Gas to Liquid), underground coal gasification. Describing the features of the underground coal gasification technology, L. Schernikau does not mention that it was a Russian scientist D. Mendeleev who introduced the very idea of such a methane transformation in 1882, and in 1888 he was the first to publish the main elements of the technological scheme of the future process¹.

УДК: 339.9

Received: November 21, 2020.

Accepted: December 10, 2020.

¹ Dmitry Mendeleev: The teachings of a prophet. *The UNESCO Courier*. 2019-3. URL: <https://en.unesco.org/courier/2019-3/dmitry-mendeleev-teachings-prophet> (accessed 11.12.2020)

L. Schernikau presents all the details related to the “shale breakthrough” in a reliable manner. He stresses the high cost of this technology as well as acknowledges difficulties in expanding and scaling this technology in the United States. In fact, the situation is much more complicated. John Dizard, an analyst for the Financial Times, states that shale gas producers in the U.S. have spent more funds than their equity capital to acquire land, drill mines and develop their programs². According to J. Dizard, the ephemeral profitability of shale gas will certainly lead to the emergence of the so-called “gas bubble”. However, there is a lack of attention to the fact that through this technology the U.S. tries to impose their own energy resources strategy on their partners in Eastern Europe (Poland, Ukraine) (Weaving 2006).

The book broadens the description of environmental problems, such as temperature changes and climate transformation, environmental pollution due to uncontrolled emissions of CO₂ into the atmosphere. L. Schernikau argues that increased CO₂ emissions from coal mining and consumption are not a disaster. He believes that improving the technology of coal-fired power plants towards a more comprehensive neutralization of emissions could fundamentally help in solving this problem. Mr. Schernikau complains that most of the newly built power plants, primarily in the East, do not possess such modern technological equipment. This statement does not correspond to reality.

Firstly, Eastern countries, or rather Asian countries, and primarily China and India, build almost all new coal-fired power plants using licensed innovative equipment to significantly reduce CO₂ emissions into the atmosphere (Barack 2020). In addition, China has recently built several power plants based on Shell’s technology with increased limitation of any emissions³. Shell supplies Chinese customers with similar mini-plants for the production of hydrogen, chemicals, fertilizers and electricity, operating on the technology of coal gasification.

Secondly, the problem of atmosphere oversaturation with carbon dioxide takes place on a larger scale. The concentration of carbon dioxide in the Earth’s atmosphere has reached record levels. The available technologies for reducing CO₂ emissions from coal-fired power plants, natural gas processing plants, fertilizers and other industries combined do not give the desired result. Humanity produces so much carbon dioxide, methane and other greenhouse gases that simply reducing emissions from industrial sites is no longer enough, and new technologies are required to extract CO₂ from the air, and do so on a global scale. Such technologies are called “negative emission technologies” or NETs⁴. NETs allow removing CO₂ or other gases from the atmosphere

² Familiar echoes in shale gas boom. *The Financial Times*. Electronic resource. URL: <https://www.ft.com/content/75942e5c-944e-11e1-bb0d-00144feab49a> (accessed 11.12.2020)

³ Shell AndWison To Develop New Generation Gasification Technology. *Shell Media Release*. URL: https://www.shell.com.cn/en_cn/media/media-releases/2011-media-release/gasification.html (accessed 11.12.2020)

⁴ Negative emission technologies: What role in meeting Paris Agreement targets? *European Academies.Science Advisory Council*. URL: https://easac.eu/fileadmin/PDF_s/reports_statements/Negative_Carbon/EASAC_Report_on_Negative_Emission_Technologies.pdf (accessed 11.12.2020)

physically or chemically. NETs will not relieve the world of the need to reduce emissions but should help to achieve zero emissions by 2050. In this case, according to calculations of the UN Environment Program specialists, it will be possible to prevent a global temperature rise above 2°C – this is precisely the goal set out in the Paris Agreement on Climate Change (Weyman-Jones 2019).

Moving on to the discussion of the so-called “green energy” based on the use of renewable energy sources, Lars Schernikau positively assesses the idea of “Energiewende” (“energy transition”), but nevertheless, he is somewhat skeptical about the real possibility of achieving it fully. The course taken by the German government to abandon not only coal, but also nuclear energy implies a deadline to increase the share of electricity from alternative sources in the country's total energy balance. The course includes greenhouse gas reductions of 80 – 95% by 2050 (relative to 1990) and a renewable energy target of 60% by 2050⁵. This concept of energy transition was first outlined in 1980 in a publication by the Institute for Applied Ecology in Germany entitled “An Energy Transition. Growth and prosperity without oil and uranium”. In the context of energy supply, this concept envisages Germany's abandonment not only of coal and nuclear reactors, but also of gas and oil, with the final complete transition to renewable energy sources. We must agree with the author that Germany will face great difficulties on this journey: the German authorities are already talking about the emerging difficulties and the lack of time required to achieve planned results⁶.

The COVID-19 pandemic plays an important role in current trends in the global energy market. Due to widespread lockdowns and a decline in economic activity, global electricity demand in 2020 has decreased significantly. Coal-fired power plants accounted for a remarkable share of the decline in electricity generation. At the same time, many of the coal power plants that halted their operations will no longer be launched again. For example, the Escalante plant (USA, New Mexico) was shut down in August 2020 due to the effects of the pandemic and will not become operational again⁷.

The author states his views on political and geopolitical issues in the development of world energy markets in two paragraphs “Political Environment” and “Geopolitics”. L. Schernikau defines that the political environment in most Western countries is harmful for the development of the coal business due to the democratic principles, i.e. the need for key authority figures to be re-elected every four or five years. The author believes that only authorities with long-term managing rights can support further ad-

⁵ The Energy of the Future: Fourth “Energy Transition” Monitoring Report — Summary. Berlin, Germany. *Federal Ministry for Economic Affairs and Energy (BMWi)*. November 2015. URL: <https://www.bmwi.de/Redaktion/EN/Publikationen/viertelmonitoring-bericht-energie-der-zukunft-kurzfassung.pdf> (accessed 11.12.2020)

⁶ Climate protection, not coal. *Deutschland.de*. URL: <https://www.deutschland.de/en/topic/environment/climate-protection-not-coal> (accessed 11.12.2020)

⁷ Coal's endgame. The dirtiest fossil fuel is on the back foot. *The Economist*. 03.12.2020. URL: <https://www.economist.com/briefing/2020/12/03/the-dirtiest-fossil-fuel-is-on-the-back-foot> (accessed 11.12.2020)

vancement of coal related technologies. According to the author, the political situation in the United States, Russia, China, Indonesia, as well as some countries of the Middle East is aimed at optimizing the development and welfare of the nation.

The geopolitical importance of fossil fuels is increasing due to the fact that Asian consumers do not have any other choice in the segment of relatively inexpensive energy sources while politicians of the economically developed countries are promoting the concept of expanding the use of expensive and uneconomical renewable sources⁸.

The book provides a panoramic analysis of the global coal market in the context of regional segments, the dynamics of demand by type of coal, logistics, pricing and modern commercial instruments: transport tariffs, exchange transactions, derivatives, etc. The book does not analyze the situation with the domestic consumption of national coal reserves as well as the “green border trade” – the volumes transported across land borders. In other words, L. Schernikau studies global coal trade carried out by sea transportation exclusively. Although the marine segment is the most significant in the global coal market, such an approach limits the applicability of this study. Many coal producers worldwide, primarily Russian companies, use the railroad for their export shipments – 32% of Russian coal exports accounts to railway shipments⁹.

The book posits that over the past decade the traditional separation of thermal coal markets into the Atlantic and the Pacific has become completely irrelevant. However, it seems controversial. L. Schernikau states that the thermal coal market has become global and relatively unified from an economic point of view due to falling sea freight rates. Indeed, recently there has been a downward trend in the global sea freight prices. In 2020, during the coronavirus pandemic this trend continues and the rates for the transportation of coal along the routes Ust-Luga (Russia) – Rotterdam (the Netherlands) and Murmansk (Russia) – Rotterdam (the Netherlands) have dropped to a ten-year minimum: 6 USD/ton¹⁰. The author's position implies that if the cost of delivery does not have a significant share in total costs then there is no economic difference between various export markers, so the market becomes global. Nevertheless, it is difficult to agree with this statement, knowing the global commodity market development¹¹. There are many other factors which contribute to regional trading patterns such as infrastructural capacities and limitations as well as the political situation, so freight cost does not always play such a significant role for the exporter (Thurber 2020). In this regard, it is too early to make such a statement about the global coal market.

⁸ Crooks E. 2018. Coal fades in developed world but is far from dead in Asia Ed Crooks. *The Financial Times*. URL: <https://www.ft.com/content/cf717854-6818-11e8-ae1-39f3459514fd> (accessed 11.12.2020)

⁹ Coal of Russia and the world: production, consumption, export, import. *CDU TEK*. URL: https://www.cdu.ru/tek_russia/articles/5/499/ (accessed 11.12.2020)

¹⁰ *Argus report on Russian coal*. URL: <https://www2.argusmedia.com/-/media/Files/methodology/argus-russian-coal-russian.ashx> (accessed 11.12.2020)

¹¹ Pospelov V.K. 2018. *Mirovie tovarnie rinki* [World Commodity Markets]. Centrkatolog. 238 p. (In Russian)

Such important topics as the logistics of coal await empirical explorations by the author. He dedicates only one page to this important topic in the section “Freight and logistics”. There is no analysis of integrated logistics, which is recognized by other specialists as one of the main factors that determine the level of competitiveness of any coal exporter¹². The author just indicates that coal logistics consists of domestic logistics and sea freight. This is followed by a statistical report on the volumes of bulk cargo shipped in 2015: coal – 40%, ore – 35%, metal – 12%, grain – 12% (p. 64).

India, China, Japan, South Korea and Taiwan cover 38% of all world coal imports in total. And the whole European imports account only for 16%, which is comparable to the volume of coal imports by Japan (p. 9). The author analyzes world leaders in terms of exports and ranks them in the following order: Indonesia, Australia, Russia, Colombia and South Africa. These five largest exporters account for almost 90% of all thermal coal exports.

The book offers a sufficient overview of the Russian coal industry. It studies in detail its strong sides (massive explored reserves, relatively cheap cost of labor, protectionism of the authorities) as well as weak sides (low quality, outdated equipment, high logistics costs, limitations of rail and port infrastructure). In conclusion, L. Schernikau states that Russian exporters have enough competitive advantages and are likely to retain leading positions in the world coal market in the long-term perspective.

One of the main conclusions of the book can cause a rather controversial reaction. The author indicates that coal can act as a “bridge” from the oil age to “the solar time” – this is how the author calls the era of large-scale use of alternative energy sources. World coal reserves are many times higher than the world's oil and gas reserves, but if the author believes that the global transition to active and widespread use of renewable energy sources will take place only after the final depletion of all oil and gas reserves after several years or decades of general coal domination, then only in this case, the coal period can be called a “bridge” to a new generation. It seems that such a transition may take place earlier during the period of the presence of both coal and gas with oil on the world energy market.

The author states that the coal supercycle may end in the period between 2016 to 2020, but despite this, demand for coal products will still be significant. Based on today's global coal market situation it is difficult to disagree with this argument. The developing regions of East Asia and Africa are showing increased demand for cheap energy, especially India and Mozambique.

The author uses definitions and key statistics from the German Association of Coal Importers (Hamburg) and the British Perret Associates (London). Sufficient information on the functioning of the world coal market as well as the author's extensive experience in the field of international coal trade distinguish the book among the other works in this field.

¹² Nozdreva R.B. 2005. *Mezhdunarodniy marketing* [International Marketing]. *Economist*. 990 p. (In Russian)

Similar to the first edition, the author maintains a style of writing that is accessible, concise, and well-organized. The book is written in a modern scientific and practical style with the use of extensive explanatory materials presented in the format of tables, graphs, figures, accompanied by practical examples, which make the work clear and give a sense of conviction to the conclusions of the author. This book offers an intellectually rich, cogently argued, and particularly valuable text, written in a clear and reader-friendly manner.

I consider the author's excessive commitment to the new European doctrine of complete rejection of coal-based electricity generation in favor of alternative energy development as a potential bias because this doctrine could not always be applied for non-European countries and especially developing countries. Another possible bias is the author's attitude to the Russian economy as a supplier of cheap energy carbon raw materials – Russian coal exporters supply not only cheap brands of coal, but also expensive brands of high-quality coal.

The author's research focus has its limitations. Firstly, the choice of time period – from 2010 to 2016 – and, secondly, L. Schernikau analyzes only international commercial operations with the transportation of coal by sea, without studying railway logistics.

In general, Lars Schernikau's book is a comprehensive study of the entire set of problems of coal business, international trade and world coal market. The strength of this work is the integrated approach to the analyzed subject and a large-scale array of information provided by the author for a more complete, comprehensive analysis of all related parameters of the coal business. The author reasonably presents the historical aspects of mining technologies development, the formation of price indicators, the mechanisms and specifics of international coal trade, as well as the general economics of complex processes of the coal business.

The drawbacks of this monograph includes a superficial description of a number of historical events, primarily of a political nature, as well as the author's one-sided position regarding the impact of coal use on the environmental problem of CO₂ emissions. At the same time, it is an authoritative source in the field of international coal trade, including statistics on supply and demand by country, technical parameters of coal assortment, recommendations for risk management at each step in the supply chain.

The target audience of the new peer-reviewed publication is quite large. Given its wide-ranging and rich content, it should therefore prove to be an invaluable and authoritative resource for economists, businessmen, politicians, as well as for employees of companies of the corresponding profile, as well as representatives of research organizations and the university community.

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Conflict of interests:

The author declares absence of conflict of interests.

Поступила в редакцию: 21.11.2020 г.
Принята к публикации: 10.12.2020 г.

Роль угля в международной торговле энергоресурсами: тенденции и перспективы

Ф.Ю. Филимонов
[DOI 10.24833/2071-8160-2020-6-75-228-234](https://doi.org/10.24833/2071-8160-2020-6-75-228-234)

ООО «Сумитомо Корпорэйшн Центральная Евразия»

Рецензия на книгу Ларса Шерникау «Экономика международной торговли углем» («Economics of the International Coal Trade: Why Coal Continues to Power the World». 2016.)

Ключевые слова: международная торговля углем, мировой рынок угля, газификация угля, сланцевая нефть и газ, загрязнение окружающей среды.

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Конфликт интересов:

Автор заявляет об отсутствии конфликта интересов.

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