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CHINESE-RUSSIAN CROSS-BORDER TRADE IN ELECTRICITY:
CURRENT STATE AND DEVELOPMENT PROSPECTS

Abstract. The article discusses the issue of the Chinese-Russian cross-border trade in electricity. The current state of the trade is analyzed, and the directions of its development are concerned.

Key words: Chinese-Russian cross-border trade, electricity production, electricity consumption, joint investments.

The development of mankind and the increase in the world population is accompanied by an annual increase in electricity production. The population of the globe amounted to 7,289 billion people at the end of 2017 and has increased over 20 years by almost 20%. Thus, electricity production reached 24,353 billion kWh, while electricity consumption doubled from 1997 to 2017 and reached 22,932 billion kWh [2].

The Russian Federation has developed the “Energy Strategy” which sets the following objectives: “retaining the country’s position in the top three world leaders in the production and sale of energy resources over the next twenty years,
increasing significantly the flexibility of export through its diversification – geographical (increasing the share of APR in total export of fuel and energy up to 30-40%), and product (increasing the share of gas, including liquefied, in the total export of fuel and energy resources to 27-29%); as well as increasing energy exports by more than 20%, including the Asia-Pacific countries by 2-3 times [1].”

The electricity market is one of the most technologically complicated one. Impossibility of storage can be distinguished as a specific property of electricity as a product. It must be produced strictly in quantities required at a certain moment, since it cannot be stored. The Chinese planned economy allowed increasing the output of the electric power industry by 12 times for 20 years: from 534 billion kWh in 1997 to 6 321 billion kWh in 2017, to obtain the first place in the world and to reach the second place in the world in terms of GDP (11 383 billion dollars).

However, the analysis of the data on electricity consumption per capita allows saying that a US citizen consumes the largest amount of electricity (11 898.5 kWh), a Japanese consumer – 8 246 kWh, a Russian one – 6 349.3 kWh, a Chinese – 3 721 kWh. The sectoral structure of the economies and, accordingly, the level of the countries’ development are very different, but the desire for innovation and higher incomes of the population are forcing the China’s economy to increase electricity production and consumption. A characteristic feature of the Chinese electric power sector is relatively weak links among various regions of the country. Therefore, the regions bordering Russia are ready not only to build their own power plants, but also to buy electricity.

At present, the relations between China and Russia are experiencing the best period in history, thus, exports of electricity from Russia to China are increasing every year (2015: 2.9 billion kWh, 2016: 3 billion kWh, 2017: 3.3 billion kWh), China’s capital investments in Russia’s electric power industry are also increasing (2015– $ 7.11 billion, 2016 –$ 7.18 billion, 2017 – $ 7.2 billion) [1]; the
investments are directed to the construction of electric generating stations in Russia and the expansion of power networks between Russia and China. Russian consumers are not restricted due to the export to China, since the electricity, which turned out to be unclaimed in the domestic market is exported. It is impossible to transfer (sell) unconsumed electricity to the RAO UES, due to the absence of modern power lines with a voltage of 500 kV and higher, thus, only neighboring countries (for example, China) can be the only consumers of electricity generated by the additional load of power-generating plants. The companies involved in selling electricity to China are PJSC “Inter RAO UES”, “En + Group”, PJSC “RusHydro”. PJSC “Inter RAO UES” is an operator of electricity exports from Russia and electricity imports to Russia. A private company “En + Group” specializes in Russian and Chinese joint investments in the development of energy industry in Siberia and the Far East, and, is engaged in the introduction of modern innovative technologies which contribute to the development of export potential of Russian UES.

The Chinese market is one of the most promising one in terms of long-term supply of electricity. Currently, the PJSC “Inter RAO UES” is engaged in export of electricity from Russia to China and is a partner of China's GES (State Electric Grid Corporation of China). The agreements between these companies were signed in 2010 for the supply of electricity from Russia to China till 2036. This cooperation is aimed at constructing new generating facilities with a total capacity of up to 10-12 million kW by 2019, as well as creating interstate electric networks in the East of Russia with a length of 1 050 km. For instance, the Bratsk Hydro-Beijing cross-border energy trading project is focused on two goals: the first is to start the export of surplus electricity generated at the Bratsk Hydroelectric Power Station (on the Angara River, commissioned in 1961) to the city of Beijing, where the last coal-fired power plant was closed in 2016, resulted in a shortage of electricity. The second goal is the modernization of the Bratsk Hydroelectric
Power Station, which will contribute to the unification of the UES of Northern China with the Siberian UES. As a result, the upgraded Bratsk Hydroelectric Power Station will supply 18 billion kWh of electricity to Beijing, the cost of the project is 1.8 billion dollars, and the income from the investments in this project during its implementation is estimated to 6-7 billion dollars a year.

Thus, joint energy projects of our countries will, on the one hand, actively develop and modernize the energy capacities of Siberia and the Far East, introduce modern technological solutions, and on the other hand, will increase non-raw material exports from our country. China is interested in implementing such projects mainly because of the restoration of the ecological balance in the country and the preservation of its economic growth.

References
