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An Overview on Russia Electricity Market

Grasu Stelian

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Transport and distribution system is overview and their connection.

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An Overview on Russia Electricity Market

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I. INTRODUCTION

Russia energetic reserves are among the greatest in the world. This makes Russia one of the leading exporters of energetic resources, manly hydrocarbons resources.

The beginnings of Russian energy industry can be found in Tsarist period when it was under control of differently ministries like finance, trade and industry or even internal affairs.

In spite of this, the development of the energy industry was very slow, government having big delays in electrification of the country. This led to considerable delay, because electrification was not considered a priority in the process of industrialization (Coopersmith, Jonathan, 1992).

In Soviet period, electrification of the country was a priority, the "State Commission for Electrification of Russia" was established in order to oversee the process on five-year program basis.

After Soviet Union dissolution, the energy system was organized under state owned company named Unified Energy System of Russia which was owned 50% by the state.

In 2002 the Russian government decide to upgrade its energy industry and begin to reform

the system by separating production, transmission and commercialization of energy.

II. RUSSIA ENERGETIC STRATEGY

In 2009 was adopted with declared scope of protecting the internal resources and the interest of Russian companies and citizens the "Energy Strategy of Russia".

Law main aim is:

- to implement coordinated strategies in order to assure the growth of the energy industry
- to promote the foundation of Russian incorporated companies in order to promote the state energy policy in international markets and to assure the development of the internal markets on competitive premises.
- to ensure predictability of the sector regulation and create premises for investments.

Law also establishes the major guidelines regarding energy strategy like:

- ensure security for energy supply
- establish an energy efficient system
- ensure environment protection

For obtaining the goals stated in Energy Strategy for Russia, government focus on:

- establish encouraging climate for combustibles and energy sector, ensuring tax, subsidies, custom and antimonopoly promoting regulations
- adopting new technical standards and implement energy efficiency requirements
- promote strategic investment in sector, especially for innovation and energy saving
- rise control in order to increase management performance of the state companies involve in energy industry

The Energy Strategy settle three main guiding axes which should be followed and implemented:

- determination for achieving the goals establish by country's energy strategy
- coordination between development of the energy sector with entire development of the country in order to avoid appearance of discrepancies
- effective measures in order to reduce the qualitative differences between inside and outside country evolution of the industry

As can see from above principles of development of energy sector, we observe that Russian energy market development will still have a major pillar the state sector.

III. ASSESSMENTS

3.1 Electricity market framework legislation

Bogdanov in "The Energy Regulation and Markets Review 2020-Russia", made a compressive presentation of the law which organize Russian energy market and how they are organized.

According its constitution, Russia is a federal state where the power is exercised by federal government solely or together with local authorities.

Main laws on energy sector are adopted at federal level, which establish also the guidelines axes of sector development. The local authorities implement federal legislation and harmonies it with at local conditions.

Energy market regulations are divided in general regulation and specific regulations like electricity, gas and oil and renewables.

General regulation draws the general principles of whole energy market. The most important laws which regulate the sector are:

- Law no.147-1995 regarding natural monopoly
- Law no. 57-2008 regarding strategic companies and the governing regulations for foreign investment in strategic sectors

- Law no. 190 -2010 regarding heat supply

Organization and activity of electricity sector is established mainly by following laws:

- Law no. 170-1995 – which regulate the production and the use of nuclear energy
- Law no. 35- 2005 – which regulate the electricity sector
- Decree 1172-2010 – which define and organize the wholesale energy market and capacity market
- Government Resolution no. 442 -2012 -which provides main regulation on the retail market which is selling electricity to final consumers (industrial and housekeepers)
- Government Resolution no. 861-2004- which provides the procedure for obtaining access to transmission facilities and services
- Government Resolution no.1178-2011- which regulates price and tariffs for electric power

(Josefson et al,2023- Electrical regulation in Russian Federation – view on <https://uk.practicallaw.thomsonreuters.com>)

3.2 Electric sector regulatory authorities

Further to Russian Law the main regulatory authority in Russian electric sector is The Ministry of Energy.

Its main scope is to enforce the state policy and law in electric sector and provide the need regulation.

Price control is assured by The Federal Antimonopoly Service which is responsible for transmission tariffs and residential tariffs. In case of monopoly practices of the players on electric sector, this service could interfere and apply fines for breaking the rules.

Implementation, monitorization of environment objectives and demands and safety and health matters is ensured by ROSTEKHNADZOR- The Federal Service for Ecological, Technological and Nuclear Supervision.

3.3 RUSSIA electricity transport and system operators. Distribution system

As per Federal LAW 147/1995 art.4 there are considered natural monopoly buying governed and owned by state the following activities in electricity sector:

- ✓ services on the transfer of electric power;
- ✓ services on the operative-dispatch management in the electric-power industry;
- ✓ services in the transfer of thermal energy;

According Federal Law 35/2003 amended 2021 -On electric power sector -The Unified National (All-Russian) Electric Grid includes country the electric network as well as the producing facilities who assure electricity delivery to the industry and final consumers. Russia electric system is designed to operate also in parallel with other countries electric systems.

Russia electric system is supervised by a joint stock company - Russian Open Joint Stock Company of Energy and Electrification "Unified Energy System of Russia"- where according Federal Law No. 35-FZ of 05.04.2013, the Russian state cannot have less than 52 % participation. According underway reform the state participation will decrease to 50% plus a voting share. This organization approves the contract for transmission of electric energy and commissioning and decommissioning to country's grid.

The electric grid facilities and (or) parts thereof is used by territorial grid organizations to provide services for the transmission of electrical energy to consumers whose power receiving devices are technologically connected to such facilities and (or) their parts.

The fulfillment of the obligations of territorial grid organizations for the provision of services for the transmission of electrical energy to consumers, the power receiving devices of which are technologically connected to the electric network and (or) their parts leased, may be ensured by the organization for the management -Unified Energy System of Russia-(clause 11 introduced by Federal Law No. 308-FZ of 06.11.2013)

According article 9 of Federal Law 35/2003-amended 2021- the organization Unified Energy System of Russia assure also the transmission of the electric energy.

For implementation and development of unified national electric grid, the organization creates schemes and programs for a long-term period.

The system operator is also an open joint stock -company but according Russian new law the state ownership should increase up to 100%.

The system operator and its affiliates, groups of persons are prohibited from engaging in activities for production, purchase and sale of electrical energy, with the exception of the purchase and sale of electrical energy (capacity) carried out for the purpose of technological support. (Federal Law No. 250-FZ of 04.11.2007)

As per Federal Law 35-2003 amended 2021 -On electric power industry, the main tasks of system operator are:

- ensure the quality parameters of energy delivery and the network system
- manage of technological modes of operation of electric power facilities
- forecast the volume of production and consumption in the electric power industry and create the reserve of energy production capacities
- develop and submit to the authorized federal executive body together with the organization for the management technological schemes and programs and participate at their implementation.
- accept commissioning and decommissioning of electric and thermal energy plants
- issue the rules for operational dispatch control of the electric power industry
- develop optimal daily schedules for the operation for electric production plants and electric network
- regulate the electric frequency of electric flows and ensure emergency functioning
- organize the parallel operation of Russian electric grid with other countries, including sale and purchase of electric energy

- establish the technological parameters for connection /disconnection to national grid
- control the technical condition of electric power facilities and power receiving devices of electric energy consumers that affect the reliability and safety of the Unified Energy System of Russia;
- organize the selection of service providers to ensure system reliability

3.4 Today electricity sector

The Russian electricity and capacity market today is a complex structure that consists of both typical market elements and public regulation mechanisms. The main problem with the existing system is low competition, owing to, on the one hand, the need for the smooth and reliable operation of the electric power sector and, on the other, the relatively small number of electricity and capacity sellers on the wholesale market.

New incentives are currently being sought for more competition on the market, particularly, by

increasing the sales of electricity (capacity) produced using renewable energy sources.

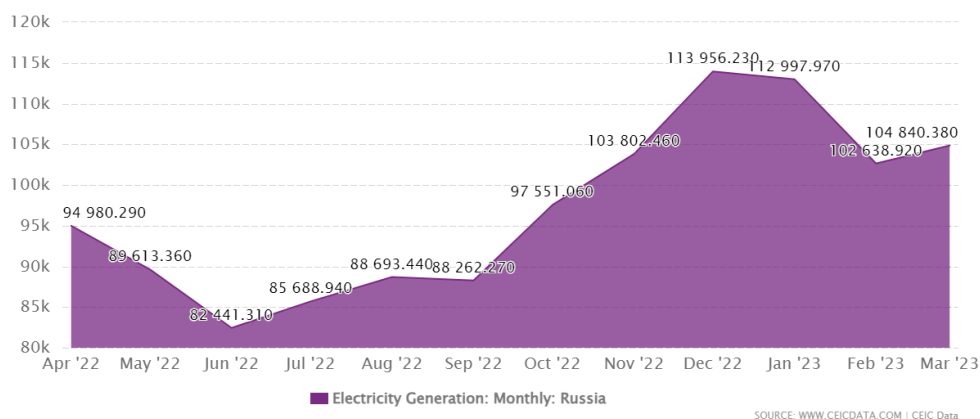
According CEIC Data available on (www.ceicdata.com) shown on bellow graphic, electricity production in Russia on period April 2022 – march 2023 (war period) decrease from 94,980.290 GWh on April 2022 to 82,441.310 GWh on June 2022.

After this year minimum the electricity production reach to the maximum of 113,956.23 GWh on December 2022 and reach to 104,840.38 GWh on March 2023.

Comparing electricity production march 2022 with march 2023 we observe an increase of 2 % from 102,639 GWh to 104,840 GWh.

The production of December 2022 (113,956 GWh) represents the maximum production till now. The negative record was reach on June 2000, when were produced 57,600 GWh

Russia's Electricity Production from Jan 2000 to Mar 2023 in the chart (www.ceicdata.com) :



3.5. SWOT Analysis on Russia electricity industry

Strengths	Opportunities
<p>1. Russian electricity grid: Developed mainly in Soviet era. Russian electricity grid cover almost entire territory bringing electricity to the industrial users and housekeepers.</p>	<p>1. Renewable Energy Development: Due its natural resources for renewable energy like solar, eolian and geothermal, Russian Federation have a very important opportunity to develop these sectors in order to contra balance the electricity produced by hydrocarbons.</p>

<p><i>2. Geographical Strategic Position:</i></p> <p>Being positioned between Asia and Europe Russia can export electricity easily for both markets, being linked to almost all-important markets.</p> <p><i>3. Hydro- electric power plants:</i></p> <p>Hydro resources are spread throughout the territory of the Russian Federation, which creates the premises for their use in hydropower plants, a large part of them being built during the Soviet period. Russia is one of the most developed countries in the world in the hydropower system.</p> <p><i>4. Nuclear Energy:</i></p> <p>The Former Soviet Union (now inherited by Russian Federation) was one of the pioneers of using nuclear energy for generation electricity.</p>	<p><i>2. Energy Efficiency Improvements:</i></p> <p>Lately Russian Federation make important steps in order to increase energy efficiency by reducing the energy loses and also by modernization of the internal grids mainly constructed decades ago.</p> <p><i>3. Export Market Expansion:</i></p> <p>Due to globalization of the world economy and the increased necessity of electricity, Russia have an important opportunity to increase its exports to its neighbors which are less endowed with electricity generation plants.</p> <p>The global trends for reducing the emission of CO₂ also provide a big opportunity for Russian renewables energy industry to increase export abroad.</p> <p><i>4. Technological Innovation:</i></p> <p>Russia's high technological capacity represent a serious advantage for the development of the electricity market by creating smart power grids as well as finding more efficient solutions for electricity transmission and storage.</p>
<p style="text-align: center;">Weaknesses</p> <p><i>1. Dependence on Conventional Energy Sources:</i></p> <p>The electricity market in Russia being mainly developed on XXTH century is significantly orientated on traditional energy forms like coal and natural gas.</p> <p>This development exposes it to the risks associated with international fuel prices and environmental internal and international regulations. volatile fuel costs and the tightening of environmental laws.</p> <p><i>2. Inefficient Energy Use:</i></p> <p>Having in view that a major part of Russia electricity generation and transmission system in</p>	<p style="text-align: center;">Threats</p> <p><i>1. Global Shift Towards Renewables:</i></p> <p>International commitment for reducing CO₂ and GHG emissions represent an important threat to Russian electricity exports which are produced by traditional sources.</p> <p><i>2. Regulatory and Policy Uncertainties:</i></p> <p>The actual changes in international policies and requirements regarding energy production, new</p>

<p>constructed in Soviet era there still a lot of problems caused by lack of efficiency in use which conduct to energy waste.</p> <p><i>3. Limited Investment in Renewables:</i></p> <p>Being very endowed with traditional resources for electricity production like coal, oil and natural gases, Russia steps to promote the renewables sources was behind other countries which can generate a disadvantage in future.</p> <p><i>4. Regional Disparities in Electricity Access:</i></p> <p>Even the national grid is spread across entire country, there are discrepancies of tits operation and functionality between urban, industrial and rural sites.</p>	<p>taxes imposed on carbon emissions and general lack of predictably is also an important threat on Russian electricity generation and export industry.</p> <p><i>3. Economic Sanctions:</i></p> <p>Russian present international policies and action lead to an international isolation of the country mainly in its relationship with western countries, which is affecting its electricity industry in the terms of the access of latest technologies and modernization investments.</p> <p><i>4. Climate Change Impacts:</i></p> <p>The present climatic changes are affecting Russia electricity industry mainly due to lack of predictability, the decrease or extreme precipitation which affect its important hydro-electric generation industry.</p>
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IV. CONCLUSIONS

Further to its strategy for development of electric energy industry, Russian government was proposed to develop:

- Gas turbines with a capacity of 300-350 MW and on this premises to achieve highly efficiency
- Develop electric energy generation based on environmentally friendly technologies using consecrated fuels like coal, solid fuel
- Develop electricity generation based on synthetic fuels use
- Construction of smart grids connection integrated in Russia Unified Energy system

These ambitious goals which involve important investment and access to the newest technologies must face the current pollical situation due to Ukraine invasion, which bar the access to scientific information and reduce substantial the investment due to redirection of about 40% of nation income to war industry.

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