Tariff Policy in the Electric Power Industry of Russia: Methods, Problems, Prospects

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Abstract. The article explores the problems of pricing and tariffs for electric energy. Particular attention is paid to state policy in the field of tariff regulation in the context of a serious transformation of the global economy. The state continues to consistently pursue a policy of containing tariffs, expanding the range and improving the quality of services of regulated companies, including services in the field of energy efficiency and energy conservation, development of distributed generation. The authors focus on problems of non-transparency of regulation, cases of unjustified understatement and overstatement of tariffs, high spread of tariffs, and imperfection of the regulatory framework in the field of tariff formation. To solve the above problems, a full-scale modernization of electric power facilities is required, the replacement of economically inefficient obsolete equipment with innovative equipment that supports the principle of smart energy systems.

Keywords: Digital technology · Power industry · Power grid complex · State regulation · Tariffs · Tariff policy

1 Introduction

Under the conditions of the global crisis and economic restrictions on Russia, the effectiveness of the state and regional economic policies in the electric power industry, which forms a significant share of the costs of producing goods and providing services, is crucial for the development of the national economy and creating a sustainable business environment. An indispensable condition for the growth of the competitiveness of domestic products is the provision of acceptable and predicted levels of tariffs for electric energy (power) and infrastructure services for potential investors and industrial consumers. The crisis in the world economy that has developed due to the COVID-19 pandemic and falling oil prices is likely to require a revision of the forecast scenarios for the socio-economic development of our country. A decrease in business activity and a well-founded increase in costs for most Russian companies will lead to a change in the economic situation of infrastructure organizations. The predicted deterioration in the situation will require a review of investment strategies, and at the state level decisions will be required aimed at updating the basic principles of tariff regulation, curbing tariff growth in the electric power industry, heat and water supply, and
sanitation. The problem is finding efficiency reserves and forming a model for making effective anti-crisis decisions on regulating prices and tariffs in the entire infrastructure sector of the economy.

## 2 Methodology

Since 2002, the directions of the tariff policy have been formed in accordance with the scenario conditions of the Forecasts of the socio-economic development of the Russian Federation, and specific parameters for changing tariffs throughout the country are set taking into account macroeconomic priorities and tasks for the forecast period and the current state of the economy. Since 2017, the growth of regulated tariffs has been limited on the basis of the adopted inflation minus rule. The long-term tariff indexation policy is focused on the level of forecast (target) inflation and is developed based on the use of industry-specific efficiency factors. Tariff growth should support inflation within the framework of target parameters that ensure the achieved standard of living of the population with a weak increase in income (Table 1).

### Table 1. Key scenario conditions and indicators for forecasting socio-economic development (baseline scenario, September 2019)

| Index                                      | 2018 Fact | 2019 Assessment | 2020 | 2021 | 2022 | 2023 | 2024 |
|--------------------------------------------|-----------|-----------------|------|------|------|------|------|
| Consumer price index, (December / December) | 104,3     | 103,8           | 103,0 | 104,0 | 104,0 | 104,0 | 104,0 |
| Average annual consumer price index        | 102,9     | 104,7           | 103,0 | 103,7 | 104,0 | 104,0 | 104,0 |

Source: authors based on [15].

The approach adopted by the Government of Russia suggests the predictability of the formation of prices and tariffs for the long term (5 years). The annual refinement of the parameters of the macroeconomic forecast practically does not affect the growth rate of prices and tariffs and allows you to create a stable investment business environment not only in the infrastructure sector, but throughout the national economy. In accordance with the adopted regulatory methodology, the principle of “moderate growth” of tariffs should, on the one hand, help maintain inflation in the target parameters, and on the other hand, provide incentives for optimization and moderate cost growth. For regulated companies, the application of this approach is a serious economic problem, since it implies «no tariff growth in real terms» [11].

In the basic scenario “Forecast of the socio-economic development of the Russian Federation for the period until 2036”, a 3% inflation rate is adopted [8]. Tariff decisions were made within the framework of the indicated restrictions: gas price indexation for 2020 will be 3%, tariffs for electric grid companies – 3%, electricity tariffs for the
population – 5%, and utility bills – 4%. Despite the sharp negative changes that took place in the world economy in the first half of 2020, tariff decisions made at the federal and regional levels generally correspond to forecast industry-wide parameters [4].

The methodology of tariff regulation allows the possibility of deviations of individual tariff decisions (both “plus” and “minus”) from the average rate of tariff growth while maintaining the specified industry-wide tariff growth parameters. Such practice, on the one hand, provides protection of the interests of consumers, on the other hand, it is difficult to evaluate the effectiveness of the tariff policy, since there are no methods of stimulating regulation of the growth of operational and investment efficiency of regulated organizations [5].

The methodology of incentive regulation of network tariffs is based on three main theoretical approaches:

– regulation based on the determination of the maximum amount of revenue or prices of a network company (revenue/price cap regulation),
– regulation by reference indicators (yardstick regulation or yardstick competition);
– hybrid methods of stimulating regulation.

**Fig. 1.** Methods of incentive regulation used in accordance with these approaches. (Source: authors)

Figure 1 shows the incentive regulation methods used in accordance with these approaches.
State tariff regulation based on incentive methods is theoretically developed and successfully applied in many foreign countries. The main objective of incentive regulation is to stimulate the optimization (reduction) of operating costs of organizations of the electric grid complex, and to restrain the growth rate of tariffs for electricity transmission services to consumers. In Russia, according to the results of reforming the electric power industry, these methods began to be applied in order to increase the efficiency of the distribution electric grid complex, and the following are the main methods of tariff regulation:

- method of return on invested capital (RAB - regulation),
- the method of long-term indexation of the necessary gross revenue.

The method of regulating the return on invested capital (RAB), in essence, includes both elements of incentive regulation and cost-based regulation. The introduction of regulation based on the RAB methodology was aimed at attracting investment into the electric grid complex. The regulatory mechanism allows you to adjust the current costs of the regulated organization, taking into account the index of efficiency of operating expenses (the index is established by the regulator), which guarantees the return and ensuring return on invested capital [6].

3 Results

In general, the introduction of long-term tariff regulation methods had a positive effect on the volume of investment in the country’s electric grid complex. However, the introduction of these methods did not allow us to solve the goal of reducing the growth rate of tariffs for services for the transmission of electricity through distribution networks, the growth of tariffs significantly outstripping the rate of inflation. In 2019, compared with 2009, tariffs for electricity transmission services increased 2.16 times, while consumer prices in the country over the same period increased only 1.91 times.

Partial liberalization of the electric power market has determined the specifics of its price regulation, which is carried out at the federal and regional levels, has a well-developed legal and regulatory framework and a complex pricing system. The Federal Antimonopoly Service makes tariff decisions in relation to the wholesale electricity (capacity) market and infrastructure organizations, sets limit tariff levels for electricity transmission services and maximum tariffs for electricity for the population [7]. Regional tariff regulation bodies establish fixed differentiated prices for electricity for the population, approve uniform (boiler) tariffs for electricity transmission services, sales allowances and the planned gross revenue of guaranteeing suppliers. The price of electricity over the past ten years has been growing at a rate close to average annual inflation (Figure 2).
The main problems of the Russian energy sector remain:

1. Cross-subsidization and reduction of the network component in the final price for electricity, since a significant network component becomes the cause of a steady increase in tariffs, a factor hampering the development of the entire national economy.

2. Reserve capacities - inefficient use of capacities occurs against the background of a chronic lack of investments in the electric grid complex, significant physical and technological deterioration of electric networks.

3. The “last mile” mechanism - as a form of hidden industry tax when large consumers connected directly to the networks of the Federal Network Company (high voltage networks) additionally pay the costs of territorial network organizations (lower voltage networks), the services of which are not actually used [14].

Losses of industrial production growth in Russia as a result of the historical practice of cross-subsidization have long remained a problematic issue in the field of tariff regulation. Cross-subsidization is when some groups of consumers pay part of the cost of electricity consumed by other consumers. As a result, prices are rising, and the rates of growth of industry and the economy as a whole are falling. The volume of cross-subsidization annually amounts to hundreds of billions of rubles, the difference in tariffs in individual regions of the country is on average four times, which significantly increases the final price of electricity for consumers. Thanks to government measures to reduce cross-subsidization, electricity prices for the population grew more slowly than for other consumers. The annual loss of gross domestic product from cross-subsidization is from 0.6 to 0.8%, which amounts to approximately 450–500 billion rubles and is potentially comparable with the annual increase in industrial production. Russia is practically the only G20 country in which the electric intensity of gross domestic product is growing. The proposal of the Federal Antimonopoly Service on the possibility of evenly distributing cross-subsidies between consumers of the distribution and backbone grid complex is likely to lead to the fact that tariffs at low voltage levels will increase and at a high level will decrease. The proposal of the Ministry of Energy of Russia to entrust payment of the increase in cross-subsidization to large consumers in the amount of 197 billion rubles by 2022 provoked a negative reaction from medium and large businesses. The additional cost burden on consumers connected to the backbone
grids of FGC UES, PJSC will limit the payback of existing and the construction of new energy-intensive consumers [3, 14].

The proposal of the Ministry of Energy of Russia for new consumers joining the networks of PJSC FGC UES after 01.01.2023 to pay for electricity transmission services at the boiler tariffs of distribution networks will lead to the same negative consequences. According to estimates of the Association of Energy Consumers, given that 2/3 of cross-subsidization is paid by large-scale “high voltage” businesses, these measures will cost the country’s economy up to 2.5% industrial growth and up to 0.5% growth in gross domestic product [4]. For example, for the most energy-intensive iron and steel companies that are most sensitive to the cost of electricity, the share of cross-subsidization in the final price will increase on average to 18%, and for non-ferrous metallurgy enterprises, the increase will be 20–30%. For comparison, the energy consumption of “non-energy-intensive” consumers is 2–2.5% of the cost of production and services. Undoubtedly, minimizing cross-subsidization in the electric power industry will create favorable conditions for the development of energy-intensive industries [9, 15].

An important decision in the field of tariff regulation was the adoption of a new approach to accounting for cross-subsidization based on the implementation of the “principle of uniform distribution”:

- the concept of “cross-subsidization rate” is introduced, which is taken into account in single and double-rate tariffs for electricity transmission services,
- the distribution of cross-subsidies should be carried out only in accordance with the guidelines approved by the Federal Antimonopoly Service [7], for the transition to a new order, a transitional period is envisaged - until 2025%,
- in case of violations by regional authorities, budgetary compensation is provided.

Switching to a new mechanism for accounting for cross subsidies will require a substantial “rebalancing” of electricity transmission tariffs in most constituent entities of the Russian Federation, the development of new regulations and methodologies that determine the procedure for calculating tariffs.

An important issue for the industry remains the rational use of infrastructure and the planning of real needs for technical connection. For ten years from 2005–2015 A major problem in reforming the Russian electric power industry was ensuring the accessibility of technological connection of consumers to electric networks. In 2015, a number of significant changes were introduced at the legislative level, aimed at simplifying procedures and reducing the time for technological connection. As a result, according to the Russian Ministry of Energy, in 2012, Russia ranked almost 184th in the World Bank Doing Business ranking by the criterion for accessibility to the electricity grid infrastructure. In 2018, according to this indicator, our country took 12th place [13].

Along with the positive result of simplifying the procedure for technical connection, the problem of optimizing network capacity reserves has sharply become aggravated. During the years of reforms in the electric power industry in the whole country, the useful energy consumption did not increase by 1 kWh, but at the same time, the installed capacity of the electric substations increased so much that they were unclaimed (there are over the necessary reserves) over 30 million kW of generation. The total maximum power of consumers with a maximum power of at least 670 kW, which are connected to the electric grids of distribution subsidiaries of PJSC ROSSETI, is 87 GW, and is used by consumers at about 44% [17].
The main opponents of the introduction of fees for the reserve of network capacities are large consumers who are willing to pay the capital costs for the construction of the necessary network section. The construction and maintenance (maintenance) of excess capacity requires appropriate operating expenses, which are included in the “general boiler tariff”. The maintenance of electric grid facilities that are used in the “reserve” mode for some consumers is paid by other consumers. As a result of inefficient use of capacities in the electric grid complex, the deficit of investments is growing, and the physical and technological deterioration of electric networks is increasing. A positive aspect of introducing a “fee for capacity reserve” is the possibility of redistributing the already existing costs of network organizations for maintaining the network infrastructure between consumers in proportion to the maximum capacity that consumers declared during technical connection, and network organizations undertook to ensure the transmission of electricity at any time. The lack of unused redundant power at the consumer reduces its payment for electricity transmission services. The negative consequences include potential conflicts between industry technical requirements and regulations (rules) of accounting for the reserve in order to pay it. In addition, a decrease in maximum power will be accompanied by expensive technical measures.

4 Discussion

The solution to the above problems and the need to search for internal reserves for increasing efficiency (dictated by the processes of economic transformation) and the growth of investment activity in the electric power industry are clearly accepted by the expert community. Unresolved questions remain about the role of the state and the mechanisms of tariff regulation in the infrastructure sectors of the economy [1, 2, 12]. Analyzing the transformation of the tariff regulation system, most authors note the following main achievements in this area. The share of liberalized markets and the long-term nature of the parameters for changing regulated tariffs at the macro level and tariffs set by specific organizations have increased; formed a multi-level system of protecting income from “tariff surges”; significantly increased the availability of information about the activities of regulatory bodies, increased consumer involvement in the regulatory process; the methodological base of regulation has been expanded, incentive tariff regulation tools are being introduced.

The noted transformations are accompanied by the introduction of digital technologies, the development of intelligent control systems, the formation of automated data centers, the development of intelligent electricity metering [16]. Digitalization of energy is not an end in itself, but is an effective tool to reduce operating costs, reduce the cost of electricity, improve the quality of services provided, and increase labor productivity. The insufficient economic efficiency of the use of digital technologies for electric power industry organizations depends on both the organizational structure of building the market and the efficiency of the tariff setting system. A distinctive feature of the foreign practice of tariff regulation is the more intense stimulating actions of regulators [10]. The highest effects of the introduction of digital technologies are possible in regions with a greater share of cross-subsidization (the presence of large consumers and a large population). However, in such regions, electricity tariffs are
already quite high, and investment programs, respectively, are limited. It is necessary to assess the financial and cost implications of digitalization for a wider range of energy companies.

5 Conclusion

In connection with the foregoing, we can conclude that over the past decade, significant positive changes have occurred in tariff regulation. Despite the emerging positive trends, there remains a significant range of issues that need to be addressed. The social orientation of state policy suggests that the “soft” policy regarding electricity prices will continue. The main problems in the medium term will remain the need to reduce administrative pressure and ensure consumer confidence in the stability of the current tariff policy, strengthen the stimulating function of tariff regulation and consolidate at the legislative level the right to preserve the economic effect of the implementation of digitalization measures in the tariffs of energy companies.

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