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Article

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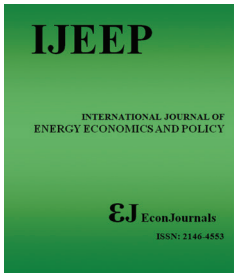

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Future Development of Price Instruments of State Support for the use of Renewable Energy Sources in Kazakhstan

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ABSTRACT

The article investigates various tools of state support for the development of renewable energy. Special attention is paid to the price instruments of state support for the use of renewable energy sources (RES), including a significant analysis of the regulatory framework of the Republic of Kazakhstan as incentives. The authors analyzed the level of development of fixed rates for the supply of electricity in the Republic of Kazakhstan. The analysis revealed that fixed rates had and continue to have a significant positive impact on the increase in projects for renewable energy. Without the use of this tool in Kazakhstan, it would not have been possible to establish such large RES capacities. The article also deals with the auction system of pricing for the supply of electricity. According to the authors, through the introduction of the auction mechanism, the state selects the most effective RES projects and forms market competitive prices for electric energy produced by RES facilities.

Keywords: Renewable Energy Sources, Fixed Rate, Auction Price
JEL Classifications: Q21, Q28

1. INTRODUCTION

Renewable energy plays an increasingly important role in Kazakhstan's energy mix due to the depletion of oil and coal resources. The Concept for the transition of the Republic of Kazakhstan to a "green economy" (2013) provides that by 2030 the structure of electricity production by 10% should consist of renewable energy sources (RES). In relation to this, the Order of the Minister of Energy of the Republic of Kazakhstan (2016) established a target indicator to achieve 3% share in renewable energy from the total electricity production by 2020. This was the basis for amendments and additions to some legislative acts of the Republic of Kazakhstan on electricity (2017). Through which a mechanism of auction bidding is taken for the selection of renewable energy projects from 2018.

The main idea of the changes is that from 2018, a new incentive system-"auctions" - will start to operate for new RES market participants instead of a preferential differentiated tariff (feed-in tariffs, FIT) or "green tariffs." The main reason for that is irrationally high level of "green tariff."

According to the Minister of energy of the Republic of Kazakhstan K. Bozumbayev (2019), the auction mechanism allowed to make transparent and understandable the process of selecting projects and investors. On the other hand, to focus on more efficient technologies and projects that minimize the impact on tariffs for end users from the commissioning of RES capacities.

It is expected that the new approaches should balance the interests of electricity consumers and other market participants. These approaches ensure the further development of renewable energy and reduce the growth of the financial obstacles on the final price of electricity, as well as promote competition between producers.

Thus, the purpose of this study is to determine the practical aspects of the use of price instruments of state support for the use of renewable energy sources in the Republic of Kazakhstan.

To achieve the goal, the following tasks must be performed:
- To review the literature on the use of instruments of state support for the development of renewable energy;
- To analyze the level of development of fixed rates/tariffs for the supply of electricity;
- To consider the auction system of pricing for the supply of electricity.

2. LITERATURE REVIEW

The development of renewable energy sources in the world is mainly carried out only with the support of the state. Which consists in the creation by the state of formal rules that change the work of the market. This, in turn, creates conditions for finding and attracting investments in the construction of renewable energy generating facilities.

Scientists identify different classifications of tools that are used for state support of renewable energy sources. For example, Shklyaruk and Malinina (2012) distinguish instruments to support renewable energy development for four modules: the elements that define the principle of support (fixed pay, allowances to the market price, quotas, tenders), the elements that define the support (type of setting the price, adapting the specified prices, etc.), the elements that define the dynamics of support (duration, intensity) and the elements that define the support costs (differentiation support, financing, the mechanism of compensation of expenses and others).

Espey (2001) singled out financial, institutional tools (first of all, normative-legal regulation and organizational measures) and tools focused on establishment of electricity production from renewable energy sources, as well as support programs and volunteer activities.

According to Kopylov (2015) it is accepted to allocate the instruments of support of renewable energy sources based on the price (fixed tariffs, price allowances, payment for power), on expenses (investment subsidies and grants, tax discounts, subsidizing), on volume (quotas, green standards, standards).

Price instruments of state support for the use of RES has its own characteristics. Renewable electricity prices are less volatile than prices for electricity produced from fossil fuels. Wiser and Bolinger (2007) highlighted that contracts in RES are usually long-term (15-25 years). These contracts involve either fixed prices or inflation indexing. In this regard, as noted by Marques and Fuinhas (2012), renewable energy is much more predictable, and it increases the predictability of the entire economy.

According to Liao et al. (2011), government support for renewable energy (as well as support for any other industry) can distort markets. This may deprive choice of consumers and lead to less efficient allocation of resources.

However, given the fact that conventional energy also receives subsidies but this type of energy has the adverse external effects arising from the use of fossil fuels. The effects are almost not measured and not accounted for environment. Which makes renewable energy more appropriate to invest in the early stages of development, but in the long term should seek a waiver of any energy subsidies.

In Kazakhstan, the first step of the state policy in the renewable energy sector is associated with the adoption of the Law of the Republic of Kazakhstan (2009) "On support of the use of renewable energy sources." This law defined the basic conditions for supporting the use of RES for the production of electricity and heat, including price instruments (fixed tariffs and auction price).

Kazakhstan scientists have made an important contribution to the study of economic aspects of traditional and renewable energy. In their studies (Yessengeldin et al., 2018; Arginbayeva, 2017) examined energy security issues, (Bolyssov, 2019) identified prospects of renewable energy in agriculture and (Abayev, 2018) focused on the possibility of using solar energy for rural development. However, Kazakh researchers do not consider the issues of price instruments of state support for the development of renewable energy.

3. FIXED TARIFFS FOR ELECTRICITY SUPPLY

One of the most common measures of state support for RES development is preferential differentiated tariffs (feed-in tariffs, FIT) or "green tariffs." The essence of this tool is that for a certain period of time for electricity produced on the basis of RES and delivered by households or companies to the network, a guaranteed, higher price is established in the form of a fixed tariff or premium to the market price of electricity. This makes it possible to offset some of the costs of the early users of the new technology and creates certainty for investors in the long term.

In accordance with the Resolution of the Government of the Republic of Kazakhstan (2014) "On approval of fixed tariffs," the practical application of fixed tariffs is started. Fixed tariffs are approved by the Government of the Republic of Kazakhstan for a period of 15 years for each type of RES. The following factors were taken into account when approving the fixed tariffs:
- Indicators of electricity generation in the Republic of Kazakhstan and its acquisition from outside the Republic of Kazakhstan;
- Indicators of consumption of electric energy in the Republic of Kazakhstan and its implementation outside the Republic of Kazakhstan;
- Indicators of generation of electric energy in the Republic of Kazakhstan by objects on use of renewable energy sources;
- International obligations of the Republic of Kazakhstan to reduce greenhouse gas emissions;
- Targets provided by the documents of the state planning System of the Republic of Kazakhstan;
- Availability of subsequent annual indexation of fixed tariffs.

The approved fixed tariffs for the supply of electricity in Kazakhstan produced by renewable energy facilities are given in Table 1.

As it can be seen, the basic objectives of the mechanism of application of fixed tariffs were to attract investment in the construction of renewable energy facilities and reduce the risks to investors to return the invested funds by guaranteed purchase of electricity for 15 years. In turn, the model of application of fixed tariffs turned out to be more applicable to the working conditions of the Kazakhstan electricity market, where is no centralized pool and bilateral contracts prevail.

It should be noted that fixed tariffs for renewable energy producers are subject to annual indexation taking into account inflation. In 2017, the tariff indexation method was revised to regulate exchange rate volatility for investors adversely affected by the transition to a floating exchange rate regime. For this purpose, indexation of the fixed tariff was made according to the scheme – 70% for inflation and 30% for foreign currency by the government of the Republic of Kazakhstan (2017). In Kazakhstan, investors in the implementation of the RES project pledge their own funds in foreign currency in the amount of 30% of the project cost. Therefore, this rule will protect only the investor's own funds, as it excludes further currency risks.

According to the statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan (2019), the value of the consumer price index is used to fixed tariffs by year as follows:

- 2016 – 116.6%
- 2017 – 107.1%
- 2018 – 106.1%.

The amounts of indexed tariffs taking into account inflation and changes in the exchange rate of the national currency to convertible currencies are shown in Table 2.

The data of Table 2 show that the tariff policy in the field of RES was annually adjusted to take into account inflation and changes in the exchange rate of the national currency to convertible currencies. The annual increase in the fixed tariff is a burden for the country's budget, as the state buys electricity at an inflated price from enterprises and individuals using alternative energy sources.

Nevertheless, preferential fixed tariffs have a significant positive impact on the development of renewable energy. In the annual report of LLP "Settlement and financial center for support of renewable energy sources" (2018) it is specified that since the launch of the mechanism for support of RES based on the centralized purchase and sale of electricity RES, the volume of purchase of electricity RES was increased from 8 million kW/h in 2014 to 779 million kW/h by 2018. The number of energy producing organizations using RES increased from 6 in 2014 to 35 by 2018.

Phasing out preferential differential tariffs is possible, but it is very risky. A promising direction for the development of domestic policy of support for RES should be the gradual abandonment of budget subsidies. This task is very difficult for developers of renewable energy incentive programs, but its solution is already overdue, and it is inevitable.

Table 1: The fixed tariffs for the supply of electric energy made by objects on use of renewable energy sources (2014)

Renewable energy technology used to generate electricity	The amount of the tariff, KZT/kWh (excluding VAT)
Wind power plants for wind power conversion	22.68
Photovoltaic solar energy converters for solar energy conversion	34.61
Hydropower plant	16.71
Biogas installation	32.23

Source: Resolution of the Government of the Republic of Kazakhstan "On approval of the Rules for determination of fixed tariffs" (2014)

Table 2: Indexed tariffs for the supply of electricity produced by renewable energy facilities (tenge/kWh)

Types of RES	Approved fixed rate	Indexed RES rates		
		2017	2018	2019
Wind power plant	22.68	26.44	28.31	30.03
Solar power plant	34.61	40.35	43.21	45.84
Hydropower plant	16.71	19.48	20.86	22.13
Biogas plant	32.23	37.58	40.24	42.69

Source: Compiled by the authors according to the Decree of the Government of the Republic of Kazakhstan (2014) and Calculation indexed fixed tariffs (2019)

4. AUCTION SYSTEM FOR SETTING THE PRICE FOR THE SUPPLY OF ELECTRICITY

An alternative to the preferential differentiated tariff is auction bidding, which is an auction for the supply of a known amount of electricity, sometimes in a certain area, under a long-term procurement contract. In comparison with the preferential tariff, this tool, as practice shows, provides less guarantees to investors. Part of the reason for this is often the long time between tenders and the aggressive competition among companies in the course of tenders.

Currently, Kazakhstan has introduced a mechanism of auction bidding for the selection of renewable energy projects. This mechanism replaced the fixed tariffs in force until 2018, which initially allowed to launch the renewable energy sector in the Republic of Kazakhstan.

The main purpose of the implementation of the auction mechanism is the selection of the most effective RES projects and the formation of competitive market prices for electricity produced by RES facilities.

In order to select renewable energy projects, amendments were made to the current legislation in the field of support of the renewable energy sector. The Ministry of energy of the Republic of Kazakhstan developed the Rules for organizing and conducting

Table 3: The results of the auction for the supply of electric energy produced by the facilities for the use of renewable energy sources in 2018

Types of plants	Volume of purchased capacity, mW	The number of applications, units	Number of winners, units	The marginal price of the auction, KZT/kWh	Maximum reduction of the auction price, KZT/kWh	% reduction in marginal price
Wind power plant	140	19	9	22.68	17.49	22.8
Solar power plant	80	25	5	34.61	25.8	25.5
Hydropower plant	20	8	4	16.71	12.8	23.4
Biogas plant	5	3	1	32.23	32.15	0.2
Total	245	55	19			

Source: Compiled by the authors according to the statistical data of JSC - "Kazakhstan operator of the electricity and capacity market" (2019) and the Decree of the Government of the Republic of Kazakhstan (2014)

Table 4: Indexed tariffs and maximum auction price for electricity supply for 2019 in the Republic of Kazakhstan

Types of plants	Indexed tariff of renewable energy for 2019, KZT/kW/h	Maximum auction price for 2019, KZT/kW/h	Change	
			KZT	%
Wind power plant	30.03	22.66	7.37	24.54
Solar power plant	45.84	29	16.84	36.74
Hydropower plant	22.13	15.48	6.65	30.05
Biogas plant	42.69	32.15	10.54	24.69

Source: Compiled by the authors on the Calculation of indexation of fixed tariffs and indexed fixed tariffs (2019) and the Order of the Minister of energy of the Republic of Kazakhstan "On the approval of the maximum auction prices" (2019)

auction tenders (2017). These Rules include the qualification requirements for bidders, the content and procedure for submitting an application, the types of financial security of the application for participation in the auction and the conditions for their submission and return, the procedure for summarizing and determining the winners.

The Guidelines for investors on the implementation of renewable energy projects in Kazakhstan (2018) indicate the main objectives of the auction system to support renewable energy in Kazakhstan:

- Achievement of target indicators of RES development;
- Reducing the impact of the RES sector on the growth of end-user tariffs;
- Ensuring the systematic development of the renewable energy sector, taking into account the capabilities of the unified power system of the Republic of Kazakhstan;
- A transparent procedure for the selection of renewable energy projects.

According to statistics of JSC "Kazakhstan operator of the electricity and capacity market" (2019), the first 10 auctions for the selection of renewable energy projects in Kazakhstan were held from May 23 to June 7, 2018 for a total installed capacity of 245 mW in electronic format. The auction was attended by companies from China, Bulgaria, Kazakhstan, Russia, France, Turkey and the United Arab Emirates. For the first auctions were set limit prices at the level of fixed tariffs, which were approved by the government of the Republic of Kazakhstan (2014).

The results of the 2018 auction for the purchase of 245 mW of electric power produced by renewable energy facilities are shown in Table 3.

55 applications were submitted to the auction, of which 19 companies were recognized as winners. The winners were given the right to sign a 15-year contract of purchase and sale of electric energy with LLP "Settlement and financial center for support of renewable energy sources."

Prices for solar generation decreased by 25.5%, hydropower – by 23.4%, wind energy – by 22.8% (up to 6 cents per kW/h). The price of biogas plants remained almost unchanged (0.2%).

The maximum auction prices for subsequent auction trades are determined based on the results of previous auction trades at the maximum price of the winner. The comparative characteristics of the indexed tariff and the maximum auction price of RES for 2019 are presented in Table 4.

The established maximum auction price for 2019 for the supply of electricity produced by renewable energy facilities is much lower (from 24.54% to 36.74%) compared to the indexed tariff.

The achievement of low prices is explained by the state's ability to create price competition among potential investors through non-discriminatory and transparent selection of projects with lower capital costs. The growing price competitiveness of renewable energy technologies, political initiatives conducive to the development of this sector, more open access to financing, the need to address energy and environmental security problems, the growing need for energy from the state also contributed to the reduction of prices for renewable energy.

5. CONCLUSION

Implementing the price instruments of the state policy in the field of renewable energy development in Kazakhstan requires systematic and balanced work aimed at: reducing the financial burden on end users of electricity; reducing the negative impact of RES on the reliability of the power system of Kazakhstan; attracting modern competitive technologies. The introduction of the auction mechanism contributed to the growth of the number

of investors willing to implement renewable energy projects in Kazakhstan. The use of the electronic format of the auction provided a fair and competitive selection of the most effective projects. What is more, projects with the best technological solutions and the lowest capital costs.

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