
State Aid Evolution in the Polish Energy Sector

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Abstract:

Purpose: This paper aimed to review Polish support mechanisms for the power industry and analyze these schemes in solutions in place across the European Union. Particular attention has been paid to six aid measures, including certificates of origin, the auctioning mechanism, the capacity mechanism, EU's emission allowances for free allocation, support measures for photovoltaics to end-users, and support provided co-generated power sector.

Design/Methodology/Approach: In this case study, descriptive and analytical methods involve a critical analysis of the literature on the subject, a study of current legal regulations and sources of Polish law, the analysis of the EU regulations, and analysis from the international perspective were applied. The theoretical basis for the methods of legal analysis is to be found in particular in the concepts developed by H.L. Hart, i.e., the concept of vagueness and openness of legal concepts or the concept of borderline cases in law.

Findings: The article seeks to verify Poland's renewable energy sources (RES) policy over the past 25 years in the context of the European Union's energy policy. As a result, the conducted analysis formulate a forecast regarding the direction of the development of Polish legal instruments of support for RES installations.

Practical implications: The research findings contribute to a better understanding of challenges in the field of energy policy in Poland in the context of EU regulations.

Originality/Value: There are no cross-sectional studies that would consider the problem of Polish legal solutions for supporting RES. Scientific works on power policy or power security in the European Union do not address how investments in the power sector should be financed.

Keywords: Energy sector in Poland, energy policy, state aid, renewable energy sources.

JEL Code: K32, P18, Q48.

Paper type: Case study.

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1. Introduction

The power industry is a strategic sector from among all economic sectors, but it also generates particularly burdensome externalities for the environment. The development of research into the physics of the atmosphere and the growing awareness among the public of the impact of carbon dioxide emissions on accelerating global warming has created a growing public expectation to reduce the burning of fossil fuels in the power industry. For this reason, much attention is paid to solutions that reduce the negative impact of the power sector on the environment (Gabryś, 2020). Such solutions undoubtedly include the use of renewable sources (RES) in the energy production process. The production of energy from renewable sources is regarded as an integral element of international efforts to combat climate change and, to this end, protect and improve the quality of the environment. Increasing social pressure to reduce emissions of pollutants and carbon dioxide is reflected in the energy policy of the European Union. Following the Directive of the European Parliament and the Council of April 2009, renewable energy was expected to contribute 20% of the total energy consumption in the Member States by 2020.

The use of RES comes with certain limitations. The main barrier is their low-price competitiveness compared to fossil fuels due to the high cost of available production technologies. As a result, the Member States resort to appropriate measures to overcome market failures and ensure an adequate level of energy production from renewable sources. Public support is an integral part of the system for producing energy from renewable sources and, therefore, aid measures granted to its producers may constitute state aid within the meaning of Article 107(1) TFEU. Support from public funds, which may take the form of state aid for renewable energy production, is a necessary and effective tool used to meet the EU's commitments in the fight against climate change.

Subsidizing renewable energy sources while simultaneously pressing to liberalize the power market in Poland and Europe has led to the lack of new investments in conventional generation sources. Under market conditions, the least efficient fossil fuel-fired generating entities sell energy at a price that does not cover costs other than variable costs. However, these sources are necessary for the operational security of the national electricity system and the intermittency of the most popular renewable energy sources, i.e., wind and solar energy.

The article aims to review Polish support mechanisms for the power industry and analyze these schemes in solutions across the European Union. The focus of this study revolves around six forms of support. Firstly, the development of systemic support for RES installations in Poland based on certificates of origin is characterized. Secondly, the reception of solutions from the other EU Member States in the Polish RES auctioning mechanism is analyzed. The third issue under consideration is the capacity mechanism on the power market, which is discussed in the context of solutions applied in other EU member states. The fourth solution concerns the use of the EU's free

carbon allocation tool. The fifth level of deliberations concerns forms of support for photovoltaics to end-user. The last issue addressed in the paper is the support for co-generated electricity.

Literature research on the subject shows that the problem under study has not received broader consideration from the proposed perspective. Reference to specific Polish legal regulations concerning the power sector is difficult to find among foreign authors. Indeed, several Polish authors have undertaken research into the changes that have taken place in this area, but the studies are fragmentary, i.e., they usually refer to a specific legislative change. There are no cross-sectional studies that would consider Polish legal solutions for supporting RES not from changing regulations but rather regarding individual types of power installations and the legal environment relevant for these installations. Due to their specific nature involving de-concentration of their placement, this seems to be of particular importance in RES installations, requiring different legal regulations.

Nevertheless, in Poland, publications prepared by Ambroziak and Stoczkiewicz concerning mechanisms for state aid in the context of the functioning of power enterprises are worth mentioning (Ambroziak *et al.*, 2020; Stoczkiewicz, 2011). Scientific works on power policy or power security in the European Union address how investments in the power sector should be financed. The studies focus on analyzing a range of statistical data and highlight the need for further modernization of the energy sector but do not specify what terms the financing of such investments might take place.

The article aims to review Polish energy support schemes and analyze these mechanisms in the European Union policies. The study formulates two hypotheses. The first thesis justifies in this article indicates that the Polish regulator uses the state aid mechanism to stimulate investment in new RES installations. The second thesis shows that despite numerous legislative changes over the last 25 years, no comprehensive regulation supporting different installations that acquire energy from renewable sources has been adopted in Poland. The paper analyses these Polish legislative solutions, which, in the regulator's assumption, aimed to increase the number of RES installations. To justify the above hypotheses, it was assumed that the increase in the rate of development of new RES installations resulted from the European Union's energy policy throughout the period under study. It should be noted that the time frame adopted in this paper goes beyond the period of Poland's membership in the European Union, nevertheless, Poland sought to adapt its policy to the requirements arising from European Union law already in the pre-accession period.

Addressing the problem under analysis is particularly important given the collapse of the Polish policy on the proliferation of new RES installations between 2016 and 2018. Although Poland was one of the countries with the highest growth volume of new RES installations between 2009-2015, including new wind installations, it recorded

regression in new capacities in 2016-2018. Not until subsequent legislative changes in 2018 has there been a slow increase in the installation of new RES capacity. This time, however, the increase has been noted in photovoltaics. The analysis of the Polish legislation in the assumed scope allows, therefore, to reflect on detailed research questions complementing the said hypotheses.

Thus, the following two questions should be raised: (1) Are there RES installations favored by Polish legislative solutions? (2) Is there a risk that the European Commission may challenge the current financial support for RES installations in Poland in the future? The purpose of this article is twofold. Firstly, it is intended to fill a gap in the foreign-language literature on shaping the legal environment for RES installations in Poland. Secondly, it may serve as a tool to compare the Polish legislative achievements in the area of the energy transition with analogous processes taking place in other European Union Member States. The article will also outline how regulatory measures can influence the inhibition of the development rate of RES installations since this phenomenon was noted in Poland between 2016-2018.

For the verification of such hypotheses, a variety of research methods were applied. This diversity arises out of the complexity and multidimensionality of the phenomenon under study. It entails descriptive and analytical methods that involve a critical analysis of the literature on the subject, a study of current legal regulations and sources of Polish law, the EU regulations, and analysis from the international perspective. Additionally, numerous sources of Polish law, EU regulations, including primary and secondary law, articles, monographs, and Internet sources, were used to describe research results deliberated on in this paper. The analysis carried out should help assess the effectiveness of the policies adopted and evaluate them in the context of global solutions.

In order to address the research questions posed in the article, it was first necessary to operationalize the critical concept, i.e., "state aid". The term is particularly problematic since there are many contexts in which "state aid" is conceptualized. A context analysis has led to the assumption that one possible context for using the term "state aid" in an EU Member State's energy sector is the energy policy of the European Union. The theoretical basis for the methods of legal analysis used in the paper is to be found mainly in the concepts developed by H.L.A. Hart, i.e., the concept of vagueness and openness of legal concepts or the concept of borderline cases in law.

It should be noted that legal institutions related to the support for RES under analysis in the article are in each case correlated with guidelines arising from the state aid mechanism regulations adopted at the European Union level. In assessing this correlation, the article seeks to verify Poland's RES energy policy over the past 25 years in the context of the European Union's energy policy. As a result, the conducted analysis made it possible to formulate a forecast regarding the development of Polish legal instruments of support for RES installations.

2. Literature Review

The need to modernize the Polish energy sector was recognized in Poland already in the early 1990s. The existing situation was caused by the technological backwardness of the Polish energy sector compared to the situation in this sector in other Western European countries. This need was also justified by the accelerated liberalization of energy sectors in the European Union. As an EU candidate, Poland was obliged to introduce more modern and environmentally friendly technologies as part of its accession negotiations. To this end, the first statutory regulations on long-term power purchase agreements were adopted as early as the mid-1990s. The legal solutions provided the rules for competitions to select projects for new or upgraded electricity generation plants. However, only plants that underwent the competition procedure could count on concluding long-term power purchase agreements (Kazanowski, 2020). The then Ministry of Industry and Trade coordinated competition procedures while a state-owned company, the Polish Transmission System Operator (Polskie Sieci Elektroenergetyczne S.A.), was responsible for conducting competitions and concluding agreements.

The first edition of competitions resulted in several long-term agreements concluded with groups of companies. These groups later became the nucleus of Polish energy corporations. The average duration of a PPA was 15 years, but the last of the agreements was not due to expire until 2027. In light of this analysis, however, specific termination arrangements for PPAs are most interesting. Each of the contracted power generators undertook to modernize and build new generation capacity and supply a minimum amount of energy to the Polish grid.

The Polish Transmission System Operator (Polskie Sieci Elektroenergetyczne S.A.) regulated the quantity of energy during the agreement term. The company was obliged under the PPA to purchase at least the minimum quantity of energy indicated in the PPA. Notably, the price was set by reference to the capital expenditure to be incurred by electricity generators. The price specified in the PPA and paid to generators was to cover the expenditure incurred in the construction or modernization of power plants and to take account of electricity production costs. Moreover, the companies selected in the competition were guaranteed a good profit margin. Unsurprisingly, the costs of such a specific way of calculating prices were ultimately borne by end-users.

As early as 2005, the European Commission considered that the PPA scheme constituted unnotified state aid and conflicted with the ban on state aid already in place at that time (European Commission, 2009). As a result, Poland was obliged to terminate PPAs, but on the terms that would take account of the losses that generators, i.e., beneficiaries of state aid, would have to bear. It should be noted that the wholesale electricity market in Poland was insignificant in consequence of the existence of PPAs. However, prices on this market were lower than those set under PPAs. This was due, among other things, that prices on the wholesale market did not include subsidies for the modernization and construction of new power plants.

Electricity generators, parties to PPAs, would have suffered significant losses upon the termination of PPAs. In recommending the termination of PPAs, the European Commission pointed to the need for a system that would compensate generators for their losses. This scheme assumed that the losses which generators would not recover from the sale of electricity after the termination of PPAs were to be secured. In other words, electricity generators, hitherto protected in their relations with banks under PPAs, would receive a kind of state guarantee (Kazanowski, 2020). The Act on Termination of Long-Term Power Purchase Agreements adopted in 2016 provided the appropriate compensation for electricity generators. The compensation was to cover so-called stranded costs, i.e., the difference between the price of electricity obtained on the wholesale market and the difference resulting from terminated PPAs. The final version of the law on terminating PPAs was approved by the European Commission and compliant with Article 107 TFEU.

The Commission considered in its Decision 2009/287/EC that the Act complied with the new methodology for calculating stranded costs set out in the relevant Communication from the European Commission of 2001 (European Commission, 2009). This was a decisive argument in favor of recognizing Polish solutions as compliant with the internal market rules. The decision also indicated that the beneficiaries of the Act, i.e., electricity generators whose PPAs were to be terminated, could benefit from state aid measures from as early as 1 May 2004. This was since the established compensation scheme provided for their correction in terms of state aid granted in the past. The aid awarded after 2004 under still valid PPAs was compliant with the internal market rules when this correction was taken into account (European Commission, 2009).

The compensation scheme for stranded costs adopted in the Polish Act is based on the transitional charge. Since the estimated cost of compensation for stranded costs is Polish Zloty 12.5 billion, it proved necessary to pass this cost to final consumers (Kazanowski, 2020). Compensation is paid in the form of annual advances corrected by a settlement considering the amount of state aid in the last year that the PPA was in force. The system for calculating compensation for each generator is case based. This results from the fact that the compensation mechanism was based on the statutory catalog of electricity generators with signed PPAs. The catalog also specified the date on which a PPA expired. No single base year was defined for all electricity generators. The transition charge, calculations, and payment of compensation are handled by the Settlements Administrator (Zarządca Rozliczeń S.A.), a company in which the State Treasury holds 100% of shares.

2.1 Establishment of Systemic Support for RES Installations in Poland - The Process of Adaptation to the EU Requirements

Solutions providing investment and operational support for RES-E generators were adopted in Poland as early as 2005. This system was based on certificates of origin, also known as green certificates, and was the essential tool to support newly

established RES installations in Poland between 2005 and 2016, i.e., until the amendment above to the Act on Renewable Energy Sources was introduced. After the amendment, only operational support has been granted based on the solutions to installations that we are entitled to receive aid measures before the 2016 amendment (Kazanowski, 2020).

The system of certificates of origin is connected with correlating the issuing of a certificate based on an application submitted by an electricity generator and the obligation of specified entities to purchase these certificates. Unlike the other E.U. Member States, Poland has decided not to introduce RES installation differentiation according to the type of RES installation. The number of certificates granted is proportionate to the amount of electricity produced from RES (Stoczkiewicz, 2011). Formal requirements for granting the certificate of electric energy can be regarded as complicated. The administrative procedure seeks to verify whether the planned RES installation will not combust conventional fuels, including wood (Act, 2015).

From the point of view of the functionality of certificates of origin, their most important element is the transferable property right that can be traded on the energy exchange. In Poland, such an exchange is made available and operated by the Polish Power Exchange S.A. (Towarowa Giełda Energii S.A.) Entities that are entitled to purchase certificates of origin are specified in art. 52 of the Renewable Energy Sources (RES) Act. These include energy companies, end-users, industrial users, commodity brokerage houses, or brokerage houses (Act, 2015). Entities specified in the Act are obliged to provide the President of the Energy Regulatory Office with information on the number of certificates of origin purchased.

However, the number of certificates is different for each of these entities. Submitting a certificate to the President of the Energy Regulatory Office is equivalent to canceling the obligation incumbent on the entity. Both supply and demand for electricity produced from RES have been artificially created through the exchange system. Suppose the entity obliged to submit a certain number of certificates of origin fails to comply with this obligation. In that case, it will be charged a substitution fee payable to the account of the National Fund for Environmental Protection and Water Management (Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej) (Act, 2015).

It needs to be explained how entities obliged to purchase certificates of origin benefit from participating in the exchange. According to the provisions of the RES Act, the cost of purchasing certificates of origin may be included in the tariff at which the energy company sells electricity to end-users. Therefore, end-users are ultimately charged for the operation of this system (Kazanowski, 2020). Changes that were made in 2015 under the amendment to the RES Act should also be highlighted. As RES generation capacity grew dynamically, the cost of the system of certificates of origin also increased. In 2013, it was decided to introduce reliefs for companies in energy-intensive sectors. The purpose of these reliefs was to encourage energy-intensive

entities to continue using energy from renewable sources despite the higher costs of the certificate system. In 2015, however, the legislation changed to allow industrial consumers to benefit from state aid.

The project of the certificates of origin assumed that the designed scheme did not constitute state aid. This assumption was based on the fact that no state funds are involved in granting or trading in certificates of origin. The entity issuing the certificates and the entity organizing the trade in the certificates were entities that got qualified as entities under state control. However, they did not in any way provide financial assistance to the parties concerned. The system of certificates of origin was not notified to the European Commission, and the decision to notify the relief mentioned above for energy-intensive enterprises was made in 2013. The same year the European Commission received a complaint regarding the use of certificates of origin for multi-fuel combustion installations and hydroelectric power plants. In light of the signals indicating the possible presence of state aid within the system of certificates of origin, the European Commission decided to review the entire system.

According to the Decision of the Commission of 2 August 2016, the Polish system of certificates of origin was compliant with the internal market rules, although a formal shortcoming related to the failure to notify under Article 108(3) TFEU was pointed out. However, when the European Commission issued its decision, the amendment to the Renewable Energy Sources Act was already underway, following which the system of certificates of origin was to be abandoned. The draft amendment to the RES Act specified that a new support scheme would be introduced from 2016, and 31 December 2015 was the last day on which certificates of origin could be obtained. Installations eligible for the scheme before the amendment came into force could receive certificates of origin for a maximum of 15 consecutive years, but no longer than 31 December 2035 (European Commission, 2016). Simultaneously, a new support mechanism for RES-E generators, i.e., the auction mechanism, was in place from 2016.

2.2 Reception of Solutions Developed by other EU Member States – The Structure of the Polish Auction Mechanism

The new support scheme for RES-E generators adopted in Poland mirrors trends in other EU Member States. Various feed-in tariff variants were the predominant support measure for RES generators before the introduction of the auction system. Such schemes operated in Germany, France, Italy, and Spain and were scrutinized for compliance with the rules on the state aid mechanism. Under the feed-in tariff system, state support involved a guarantee to purchase electricity from RES at a certain price.

Depending on the Member State, the guaranteed price ensured coverage of either the costs resulting from the investment made in the RES installation and the costs resulting from the difference between the wholesale price of electricity and the actual price of RES-E production, or only the costs resulting from the difference in the price

of RES-E. The feed-in tariff system is similar to the solutions adopted in the Polish system of PPAs except that other Member States do not conclude agreements for such a long period.

The introduced auction system implies that RES-E generators compete with each other, but the competition concerns the amount of support expected. In other words, entrepreneurs participating in the auction mechanism submit bids including the amount of support expected for the production of a specific amount of electricity. The more favorable the bid, the greater the chance that a given generator will receive state aid (Kazanowski, 2020). In the case of the auction mechanism, the decision was made to differentiate between RES installations, which translates into three types of auctions that are organized. Support is granted to installations that are being modernized, new installations, and installations that are in the transition period between the system of certificates of origin and the auction mechanism. Singling out the last group is, therefore, an incentive for generators who are still covered by the certificate system.

The subject of the bid is an important characteristic of the Polish auction mechanism. In most Member States it is generating capacity installed in RES that is offered at auction (Stoczkiwicz, 2011). The bidder auctions the power at its disposal whereas bids are independent of the quantity of electricity produced by the installation. The structure of the auction mechanism in Poland has been modified. The amount of electricity to be produced by RES installations is the subject of the offer and the bidder undertakes to produce and feed a specific amount of energy into the electricity grid.

The Polish solution seems to provide a more realistic mechanism and a higher level of reality to the mechanism since bidders are obliged to analyze their offer in terms of market demand. They offer as much electricity and at such prices as will be commercially acceptable to the market. In contrast, a system based solely on generating capacity can result in system distortion. Indeed, bidders may offer large quantities of generating capacity, but they do it in isolation from their real capacity to use it. Still, a capacity-based system may be used in the national energy policy as an incentive for the dynamic development of RES installations. Therefore, the auction mechanism based on a system adequate to the developed RES market may be considered a misguided solution from the perspective of the condition of the Polish energy sector.

The scope of auctions is determined each year by the Council of Ministers, which, by way of regulation, defines the maximum quantity and value of RES-E that can be sold under the auction mechanism (Council of Ministers, 2020). Separate auctions are held for each technological group of RES installations. Auctions within each of these groups are divided into further sub-types depending on the installed capacity. Separate auctions are held for installations with power up to 1 MW and for installations whose generating capacity exceeds 1 MW. Auctions are limited by a reference price determined by a regulation of the minister for energy. The reference price is the

maximum price that can be achieved by a given type of RES installation in an auction (Minister for Energy, 2019).

The bidder who offers the lowest energy price wins the auction while the number of selected offers depends on the quantity and value of electricity that can be purchased. These values result from the above-mentioned regulation of the Council of Ministers. A maximum of one bidder may sell the amount of electricity equal to 80% of the quantity of electricity offered by all the bidders in the auction, but not exceeding 100% of the quantity to be purchased in the auction (Act, 2015).

The auction system provides support to electricity generators if several participants in the auction offer the same selling price for electricity and that price turns out to be the lowest. The winner will then be selected on the basis of the order in which bids were submitted. Once submitted, the offer can no longer be changed, which is why a time-dependent solution was chosen. Notably, entities that participate in the auction are treated on equal terms from the perspective of the overall aid measures that have been granted. Indeed, it should be pointed out that the auction mechanism, and in particular the reference price, constitutes a state aid measure of an operational nature. Generators who benefit from investment aid for the construction or modernization of RES installations and at the same time participate in the auction mechanism would be unjustifiably favored over generators who do not benefit from operating aid. As a result, a decision at the level of the Renewable Energy Sources Act was made to deduct investment aid costs from operating aid. This deduction ensures that all participants in a given auction are guaranteed an adequate level of competitiveness.

In 2017, the Polish auction mechanism was found to be fully compliant with the internal market rules (European Commission Press Release, 2017). The value of aid measures related to the application of the auction mechanism that was to be granted between 2017 and 2021 was estimated at €9.4 billion. According to the European Commission, there are two types of aid measures operating under the Polish auction mechanism. The first of these measures include guaranteed premiums for small-scale RES installations with a generation capacity of up to 500 kW. By contrast, installations with a generation capacity over 500 kW receive premiums in the form of a surcharge to the market price of electricity.

This premium is intended to compensate for the costs of RES upgrades that cannot be covered from revenues from the sale of electricity on the market. Due to the premium, the rate of return on investment in the RES installation is increased. According to the European Commission, the Polish scheme will foster the development of RES technologies, which is expected to translate into the implementation of energy and climate policy objectives by 2020. At the same time, the EC considered that the auction mechanism would contribute to the increase in the production of RES-E in Poland, and any distortion of competition caused by the granting of state aid was limited.

In our opinion the above consideration of the European Commission confirms the thesis on the role of the state aid mechanism in the construction of the energy policy for the European Union. There is no doubt that the structure of the Polish energy sector, assessed from the perspective of the EU energy and climate policy, requires significant transformation. What seems problematic from the point of view of the said EU policy is the high share of energy produced from conventional sources and still low share of energy from renewable sources in the structure of the Polish energy sector. A comprehensive and well-structured mechanism for the purchase of RES-E can attract investors who want to allocate their capital in this type of investment. This is because such a mechanism provides investors with a state guarantee that their investment will yield a return within a specified period. The European Commission, which oversees the implementation of energy and climate policy as part of state aid proceedings, was able to give Poland the direction in which the aid mechanism should evolve.

However, it should be noted that the European Commission's actions taken between 2016-2017 were based on data from 2010-2015 during which time there was a dynamic increase in investment in new RES installations in Poland. No data was then known to indicate that the legislative action taken in 2016 would lead to a halt in investment in new RES installations. Taking this fact into account, the European Commission's decision seems justified as it shows that the auction mechanism in its approved form would be beneficial to the development of RES installations in Poland. The EC assumed that the dynamic growth of RES investments in Poland was likely to continue. However, this did not happen. Although structurally correct, the auction mechanism currently in place in Poland seems inadequate to the level of development of the RES infrastructure in Poland.

A further amendment to the RES Act was adopted in 2018, which introduced, *inter alia*, a fixed purchase price mechanism (Act, 2018) representing the price of electricity at which the seller must purchase it from the RES generator, or which would constitute the basis for calculating the negative balance for the RES generator (European Commission, 2009). The fixed purchase price mechanism applies only to certain RES installations, which are differentiated by technology. Installations that can benefit from this mechanism include installations that use solely agricultural biogas, landfill biogas, sewage treatment plant biogas, other types of biogas, and hydropower.

Therefore, electricity generators from such installations do not have to use the auction mechanism. If the President of the Energy Regulatory Office receives a declaration on the use of the fixed purchase price mechanism, an electricity sales agreement is concluded with the generator. Nevertheless, it should be noted that the fixed sales price mechanism is an alternative to the auction mechanism (Act, 2015). In fact, the generator may take a risk and place a bid under the auction system hoping to obtain a better purchase price provided that the reference price laid down in the relevant regulation of the Council of Ministers is more favourable in a given year.

The feed-in premium system for small RES electricity generators was revised in 2019 (Act, 2019). Consequently, an installation with a generating capacity of less than 500 kW may receive support in the form of a feed-in tariff whereas small generators sell electricity produced in their installations directly to entities obliged to purchase such energy (e.g., electricity companies). The obliged entity pays 90% of the reference price applicable on the date electricity is sold. Therefore, an electricity generator that applies this solution will receive a 10% lower price than the price which would result from the fixed purchase price mechanism. However, in the case of larger installations with a capacity of more than 500 kW, but less than 1 MW, the guaranteed premium also constitutes a state aid measure. It is, however, paid directly by Zarządca Rozliczeń S.A.

The feed-in premium corresponds to the difference between the fixed purchase price and the price that RES-E earns on the wholesale energy market. To guarantee a level playing field in competition, the investment aid granted to entities eligible for a feed-in premium is also calculated in such a way that the investment premium and the operating premium are not cumulated within the same entity (Kazanowski, 2020). It should be noted that the introduction of new types of state aid into the Polish system of support for RES-E generators in the form of feed-in tariffs and feed-in premiums will require a state aid notification. As of the end of March 2020, such notification has not yet been made.

2.3 Capacity Mechanism - Specificity of the Polish Power Market Solutions Against the Background of Solutions Adopted in other EU Member States

As in the other EU Member States, the risk of underinvestment in the electricity sector has been recognized in Poland. Capacity mechanisms in place in various Member States are primarily aimed at building a reserve capacity to cope with sudden increases in demand for electricity in the national grid (Stoczkiewicz, 2011). However, in addition to ensuring adequate supplies, the Member States seek to achieve other objectives when introducing the capacity mechanism. Typically, the aim is to ensure the modernization of energy infrastructure. Nevertheless, there are cases of objectives closely related to the level of development of the electricity grid of a given region or even to the economic level of development of areas of a Member State.

The European Commission's State Aid Guidelines indicate which objectives may serve as guidelines for developing their generation capacity systems. First of all, these systems should be complementary to other RES installations. As already indicated, these systems are intended to have a backup function, but only for RES installations. There is no doubt that the flexibility of RES installations is much lower than in the case of conventional power plants. Wind power plants are in particular dependent on weather conditions. The purpose of capacity mechanisms is to enable energy generators to obtain additional income to invest in infrastructure maintenance. It can, therefore, be concluded that the capacity mechanism is an artificially constructed market in which various forms of aid are allowed. While maintaining a level playing

field in competition among participants, this mechanism is intended to compensate for losses resulting from RES-E production.

Initially, Poland used a mechanism called the single-commodity market. The scheme, however, contained several flaws, not exclusively attributable to Polish legislative solutions. This is because electricity generators in this scheme receive revenues from the sale of electricity and the scheme fee. However, the European Commission challenged systems based on a scheme fee introduced in individual countries because they resulted in unsustainable development of RES installations. Indeed, decisions to build RES installations were made by calculating the profitability of the investment solely based on an expectation to receive state aid. The single-commodity market scheme proved inflexible. Any changes required new legislative solutions, which was inefficient for the operation of the energy sector.

The Polish capacity market system is based on the British solutions approved by the European Commission as compliant with the internal market (Kazanowski, 2020). The capacity market is to encourage entrepreneurs to build new generation capacities and modernize the existing installations. The Polish capacity market relies on a capacity obligation. Generation capacity and the quantity of this capacity are traded. The Polish Transmission System Operator (Polskie Sieci Elektroenergetyczne S.A.) is the buyer of the capacity. The company procures capacity from the bidder, i.e., electricity generators, and has a capacity obligation to supply sufficient capacity and constantly stand ready to support the national electricity grid with the purchased capacity. The capacity obligation varies in terms of its duration. It may apply to a full calendar year or individual quarters. Hence, auctions organized on the capacity market are divided into main auctions (for a calendar year) and additional auctions (for a given quarter). The first main auction in Poland was carried out in 2018 and concerned the capacity delivery in 2021 and 2022. The capacity obligation will be exercised from 2021. The power demand is determined by the President of the Energy Regulatory Office once the minister for energy has approved the capacity demand curve.

Not every RES installation may participate in the capacity market. As in the case of capacity systems in the other EU Member States, a certification system for RES installations has been introduced. An installation that fails to pass the certification process cannot participate in the capacity market. The certification process is organized by the Polish Transmission System Operator (Polskie Sieci Elektroenergetyczne S.A.), which cooperates with local electricity distributors. Three types of the certification process have been introduced, including general, primary, and additional auction. Each installation must pass the general certification. If the installation wishes to participate in the primary or additional auctions, it must also go through relevant certification processes. Obtaining a certificate for participating in the main auction does not entitle the holder to participate in the additional auction unless duly certified.

The formula for auctions held in the capacity market is slightly more complicated than the auction mechanism used for RES or high-performance co-generation installations. This results from adopting the Dutch solution, which sets a single closing price for the auction. All successful bidders receive a single price per unit of the offered capacity. The auction is carried out until the balance of supply and demand for capacity is struck. Successful bidders conclude a capacity agreement involving three parties, i.e., the electricity generator (capacity provider) selected in the auction, the regional electricity distributor, and the power market administrator of settlements, which on the national scale is a particular purpose company, wholly owned and controlled by the State (Zarządca Rozliczeń S.A.). The company is responsible for making payments under a capacity agreement. The payment constitutes state aid granted to beneficiaries, i.e., bidders participating in the capacity market. Capacity agreements are concluded for up to 15 years if the entity delivering the capacity is a new installation, up to 5 years if the entity delivering the capacity is a modernized installation, and up to 1 year for other entities, including foreign ones.

It is interesting to note how the obligation to stand ready to provide capacity is defined, considering it is one of the two essential capacity obligations. The performance of this obligation assumes the delivery of the contracted amount of capacity in a situation of sudden demand from the national electricity grid. This applies in particular to hours of peak demand. If the obligation to supply capacity is fulfilled in excess, the generator is entitled to a premium. Conversely, if too little capacity is supplied, the generator will be charged a financial penalty (Kazanowski, 2020).

The costs of operating the capacity market have been passed on to end-users, who pay a capacity charge as part of their electricity bill. This charge is added to the electricity supply fee. The capacity charge varies according to the category of the end-user and concerns households, for which a flat rate applies. The capacity charge is determined in proportion to the amount of electricity consumed during daily peak periods for other consumers. It should be noted that money collected from end-users as the capacity charge is transferred to Zarządca Rozliczeń S.A., which is under state control.

Since the company finances the capacity market scheme under state control, it was necessary to notify the scheme as state aid. By the Decision of February 2018, the European Commission approved the Polish design of the capacity market as compliant with the internal market rules (European Commission, 2018). This decision was, however, challenged before the CJEU (Complaint, 2019). Two rather vague pleas in law were made against it. The first plea in law alleged a procedural error by the European Commission in failing to initiate the first stage of the formal investigation procedure. As a result of this failure, the European Commission allegedly did not adequately investigate the doubts raised in connection with the Polish capacity market. By contrast, the second plea in law alleged a failure to provide adequate reasoning for the decision issued by the European Commission. No other resolution of this matter, other than the contents of the complaint, had emerged by the time this paper was completed.

In summary, the Polish capacity market mechanism responds to the measures taken by the other Member States, which recognized sufficient investment in energy infrastructure. There is no doubt that the structure of the Polish capacity market, in particular auctions and the system of certification qualifying for participation in auctions, implies that installations must be maintained in proper condition. Otherwise, installations will not participate in auctions and consequently will not receive payment under the capacity agreement. Although the capacity market design in Poland indeed contains positive elements, the significance of this scheme about the overall Polish energy sector is still under question. The share of the capacity market will remain marginal if the rate of RES proliferation is not increased.

The fact that the capacity market has been established confirms the argument that the European Union's energy policy is still in the implementation phase. Several European Union countries adopted solutions involving the capacity mechanism some five years earlier than Poland. Thus, Poland was able to draw on the experience of Western European countries, which it did, in particular by applying British and Dutch solutions. On the other hand, there is still a delay in implementing new legislative solutions for the energy sector in Poland.

The ruling of the CJEU regarding the complaint against the decision of the European Commission on the approval of the Polish capacity market will be of significance. Although the pleas in law raised in the complaint are vague, the European Commission committed a somewhat procedural severe error by omitting the first stage of the formal investigation procedure. Nevertheless, the action of the European Commission concerning the Polish capacity market confirms the thesis that the state aid mechanism is used by the European Commission to implement the EU energy and climate policy. While varying in detail across the EU Member States, capacity mechanisms meet common objectives outlined by the European Commission in the State Aid Guidelines. These mechanisms primarily increase energy security and ensure continuity of supply. The case of Poland may seem exceptional in this respect as the use of energy generated by RES installations is low in the overall electricity structure of the country. Nevertheless, the introduction of such a scheme in Poland is an expression of the increased cohesion of the energy sectors of the Member States achieved through the appropriate use of the state aid mechanism.

2.4 Application of the EU Tool for Free Allocation of Carbon Dioxide Emission Allowances - Polish Struggle in the Context of the Structure of the National Energy Sector

One of the critical tools of the EU energy and climate policy is the greenhouse gas emission allowance trading system. This scheme aims to reduce greenhouse gas emissions across the European Union gradually. The objectives relating to reducing greenhouse gas emissions laid down in the program documents of the European Union's energy and climate policy would remain nothing more than empty

declarations made by politicians if no tools were introduced, which the Member States might use to build low-emission economies.

At present, the trading system for greenhouse gas emission allowances at the European Union level is regulated by Directive 2003/87/EC (European Parliament, 2003). The significance of this system lies in the fact that it provides a tool that meets the prerequisites of state aid. It would be beyond the scope of this article to present all the rules of the carbon dioxide emission trading system. However, an aid measure, which is relevant to the transformation of the energy sector of each Member State, should be highlighted.

This tool involves investment aid in the form of free allocation of carbon dioxide emission allowances. Once certain conditions are met, electricity generators can become beneficiaries of such aid. In their case, the granting of free carbon allowances comes in the form of investment aid. Indeed, the award of free allowances is conditional on investment in modernizing energy infrastructure. Investments undertaken in this area must increase the level of energy efficiency and the level of energy security. The Member States prepares the investment catalog in the form of KPI (Kazanowski, 2020). Therefore, investments that beneficiaries of this operating aid make need not cover only the infrastructure belonging to a given electricity generator. These are investments of general significance for the entire energy sector or the national power grid.

Free allocation of carbon dioxide emission allowances may also apply to investments made by an electricity generator within the infrastructure of the electricity sector of that generator, provided that the generator decides to make such an investment at a reduced cost. Thus, if an electricity generator decides to make an infrastructure investment irrespective of the operating costs or whether the investment will be profitable, the generator implements a so-called cost-reduced investment. Free allocation of allowances involves linking total investment costs to the value of awarded allowances. However, not all investment costs can be offset against allowances, and only expenses that meet the eligibility criteria may be deducted from total investment costs.

Poland implemented Directive 2003/87/EC within the framework of the Law on the Greenhouse Gas Emission Trading Scheme (Law, 2015). Article 27 of this Law provides that "For the settlement period starting on 1 January 2013, electricity-generating installations that were in operation no later than 31 December 2008 or electricity generating installations for which the investment process was physically initiated no later than that date may be allocated emission allowances under the rules set out in this Chapter". Article 7 of this Law provides that the scheme is managed and administered by a public administration entity called the National Centre for Emissions Management (Krajowy Ośrodek Bilansowania i Zarządzania Emisjami). Given the participation of the State in the organization of the scheme and the decision-making process concerning the allocation of aid in the form of free carbon dioxide

emission allowances, the scheme had to be reviewed from the perspective of the state aid mechanism.

The European Commission recognized the compliance of the Polish mechanism for awarding free allowances by Decision of July 2012 (European Commission, 2012). The Decision was, however, conditional. Following Article 1 of the Decision, the European Commission challenged some of Poland's investments in the KPI plan. Indeed, to approve the mechanism for awarding free allowances, Poland had to specify which investments were planned to be carried out by electricity generators. In the opinion of the authors of this article, the fact that the European Commission challenged some of the investments, which Poland considered to be strategic, is also a manifestation of the European Commission's use of the state aid mechanism to implement the standard energy policy.

The possibility of awarding carbon dioxide emission allowances free of charge is an essential privilege that the Member States willingly exercise. It should be noted that the link between the system of allocating free allowances and investments in the modernization of the energy sector was made at the level of the EU directive and not at the national level. When the Member States submit their notification of the design of the free allocation scheme, they are also required to provide a list of investments that they consider to be strategic for the financing of the scheme.

The Member States are in principle free to determine which investments will be included in the KPI strategic scheme. Nevertheless, as the case of Poland has shown, the European Commission may consider that the list of proposed investments does not comply with the Energy and Environmental State Aid Guidelines (EEAG), thus forcing a Member State to rebuild the KPI investment catalog.

Given the conditional form of the European Commission's Decision, it turned out necessary to conduct the procedure of notifying state aid for awarding free allowances under Article 108(3) TFEU. Following a formal investigation procedure, the EC issued a favorable decision concerning the Polish system of allocating free carbon dioxide emissions (European Commission, 2014). Following this Decision, the Polish KPI scheme ensures a more significant share of energy generation from RES and diversification of the Polish energy mix through several investment projects eligible for financing under the allocation of carbon dioxide emission allowances.

In line with the assumptions of the European Commission adopted in the Decision, by 2020 the installed capacity of electricity generation from power plants based on hard coal and lignite should fall from 31 375 MW to 28 854 MW and the installed capacity of RES should increase as follows:

- wind power plants: from 2 645 MW to approximately 6 650 MW;
- hydropower plants: from about 966 MW to about 1 152 MW;

- solar (photovoltaic) power plants: from approximately 1.3 MW to approximately 3.0 MW;
- biogas-based sources: from approximately 136 MW to approximately 980 MW;
- biomass-based sources: from approximately 876.1 MW to approximately 1 550 MW (European Commission, 2014).

In line with the above assumptions, the most significant part of RES-E in Poland will be generated by wind power plants. As the European Commission pointed out, such development of RES was expected to require a reserve from conventional sources, mainly gas based. A modified KPI scheme assumed the strengthening of Polish gas installations and was intended to increase the share of electricity generation based on gas significantly. This development indeed took place as there was a noticeable increase in gas-fired electricity between 2015 and 2019. The Commission considered that linking the mechanism for the allocation of free carbon dioxide emission allowances to investments in gas installations “will be able to bring down the level of reliance on fossil fuels (in particular coal and lignite) and will contribute sufficiently to the aim of diversifying energy production” (European Commission, 2014).

With the benefit of hindsight, the actions taken by the European Commission concerning the Polish mechanism for allocating carbon dioxide emission allowances should be viewed positively. Although investments in new RES installations came to a halt after 2016, the role of gas installations continued to grow. Given the growing demand for electricity in Poland, new gas installations prevented the increase in fossil fuels (hard coal and lignite) rather than a reduction in their use.

2.5 Support Measures for End-users in the Field of Photovoltaics - Polish Idea for Accelerating the Proliferation Rate of new RES Installations

As a result of legislative changes in 2018, photovoltaics is the only RES installation that has been re-proliferated on a larger scale in Poland. According to the Polish Transmission System Operator (Polskie Sieci Elektroenergetyczne S.A.), a 181% year-on-year increase in photovoltaic installations was recorded in March 2020. The increase resulted from the launch of state subsidy schemes for end-users, including natural persons referred to as prosumers.

Following the RES Act, a renewable energy prosumer is a final consumer who purchases electricity under a comprehensive agreement and produces electricity exclusively from renewable energy sources in a micro-installation for own non-business use (Stoczkiewicz, 2011). An entity wishing to become a prosumer must have a single contract to purchase and distribute energy, a so-called comprehensive agreement. The advantage of photovoltaics is that it can be proliferated at a relatively low cost as there is no need for a significant electricity grid development. In addition, photovoltaic installations are particularly well suited for areas where the electricity grid development would be complicated due to, e.g., terrain.

A renewable energy prosumer can be a household (natural person) and a business or another type of entity, such as a housing association or cooperative, for which electricity production is not the main business activity. To be considered a prosumer, electricity must be produced solely for own consumption. Furthermore, a photovoltaic installation eligible for support must correspond to a micro-installation, meaning its total capacity must not exceed 50 kW. A micro-installation may be connected to the electricity grid with a rated voltage below 110 kV (Stoczkiewicz, 2011).

The system of discounts introduced by the 2016 amendment to the RES Act was the first step in developing PV installations in Poland. The discount scheme assumes that energy that has been generated in a RES micro-installation and subsequently connected to the electricity grid of the regional operator is fed into the electricity grid if not used for household needs. Up to 80% of the stored energy can be withdrawn from the grid at no extra cost when the generator does not produce electricity or produces insufficient energy to meet current demand. Support in the formula of a system of discounts is provided for prosumers for 15 years, but no longer than 31 December 2035.

The Regional Operational Programmes for 2014-2020 was the primary source of support for developing PV micro-installations. However, in 2019, a program directly financed by the National Fund for Environmental Protection and Water Management called "My Electricity" was launched. The program aims to increase the production of electricity from micro photovoltaic installations. The program's implementation is expected to provide a more decisive impetus for the further development of prosumer energy as opposed to diversified regional measures. The assumption is that with prosumer-oriented photovoltaics, Poland is expected to significantly increase the share of RES installations in the national energy mix and meet the requirements of the EU's energy and climate policy. The budget of this program is earmarked at Polish Zlotys 1 billion.

2.6 Support for Electricity from Cogeneration Installations - Intermediate Option between Maintaining Coal-based Power Generation and Building New RES Installations

Support for cogeneration installations is one of the elements of the energy policy of the European Union, which is in line to increase energy efficiency. Directive 2004/8/EC on investment and operating aid to promote cogeneration was an example of the role of this element (European Parliament, 2012). Mechanisms involving operational support for cogeneration installations were introduced at a relatively early stage in Poland. In 2007, regulations establishing a system of certificates of origin for cogeneration were introduced. The system of certificates of origin was in line with the solutions concerning support for RES installations in force at the time.

The principle-based on which the system of certificates of origin worked was identical to that of the system of certificates of origin for RES installations. Three types of certificates of origin were introduced depending on the installed capacity of the unit and the type of fuel combusted in the cogeneration installation. In 2016, the European Commission considered that the inclusion of cogeneration installations in the scheme of certificates of origin constituted state aid, and as a result, it initiated a procedure regarding aid provided to cogeneration installations. The Commission considered the extension of the scope of the support to be compliant with internal market rules but pointed to procedural irregularities resulting from the non-notification of aid measures (European Commission, 2016a). Following the decision, in this case, a cogeneration plant was built by a Polish oil refiner and petrol retailer in Płock (PKN Orlen), in which cogeneration technology was also installed. A yellow certificate supported the construction of this installation. The European Commission also initiated a procedure in this case and considered that irrespective of procedural shortcomings, the aid for this investment was compliant with the internal market rules (European Commission, 2019).

Support in the form of certificates of origin for cogeneration installations was available until the end of 2018. In 2019, a system of premiums to the market price of energy was introduced since the Law on the Promotion of Electricity from High-Efficiency Cogeneration entered into force (Act, 2019a). Accordingly, the system was based on operational assistance administratively coordinated by a state-owned company (Zarządca Rozliczeń S.A.). To receive aid in the form of a premium, a connection to the public electricity grid and district heating network is required. The amount of the premium depends on the nature of the installation and the installed generating capacity. Four types of premiums were distinguished, i.e., the feed-in premium for small cogeneration installations between 1 MW and 50 MW, auction premium for small cogeneration installations between 1 MW and 50 MW, the feed-in premium for cogeneration installations above 50 MW, premium granted through a call for proposals for cogeneration installations above 50 MW (Kazanowski, 2020).

The auction mechanism in place is similar to the solution adopted to support other RES installations. Auctions are organized by the President of the Energy Regulatory Office and are divided according to the type of fuel used in a given cogeneration plant. Energy generators from cogeneration installations submit bids in which the amount of electricity that can be sold is specified. Unlike bids in the RES auction mechanism, the bid in this case also contains the expected level of the premium. Therefore, the higher the amount of electricity offered for sale while maintaining a low expected premium, the higher the chance of winning the auction.

As in the case of auctions for other RES installations, in the case of auctions for cogeneration installations, the minister for energy determines by regulating the volume of energy and the maximum price that can be achieved. The auction procedure for CHP installations is identical to that for other RES installations. The amount of support depends on the sums for which bids have been submitted. Once submitted, a

bid is a no more extended subject to modification or negotiation. Different rules were adopted concerning the period of the support payment. Auctions cover a period of as many as 15 years, which is an additional security factor for companies choosing to install this type of installation.

The auction mechanism is, however, not the default form of support for most CHP installations. As already indicated, it only applies to installations with a capacity greater than 50 MW. Feed-in premiums are the predominant form of support for CHP installations, and the amount of the premium is set annually in the relevant regulation of the minister for energy (Minister for Energy, 2019a). Suppose the President of the Energy Regulatory Office decides to grant support in the form of a feed-in premium. In that case, the installation may receive the premium for the following 5 to 7 years or up to 15 years, depending on the type of installation and the investment costs incurred in connection with the construction of the installation (Minister for Energy, 2019).

It should be noted that in the case of feed-in premiums granted to installations with a generating capacity exceeding 300 MW, a notification to the European Commission is necessary. Such aid was granted to those mentioned above highly efficient cogeneration installation - PKN Orlen in Płock. In the absence of notification of the aid measure granted, the European Commission initiated the relevant procedure.

The most specific form of granting aid, which occurs only in the area of cogeneration installations, is the call for bid procedure (Gurgacz, Jarosiński, 2020). This procedure applies only to new or substantially modernized installations with generating capacity of less than 50 MW (Act, 2019). The selection procedure is organized by the President of the Energy Regulatory Office and carried out at least once a year. It involves an initial phase, i.e., the administrative assessment of the application and a content-related assessment of the applications. Bids submitted in the calling procedure are similar to those submitted in the auction scheme. How the call is conducted is laid down in a separate minister's regulation for energy (Minister for Energy, 2019).

In summary, the Polish support scheme for cogeneration installations was structured as a hybrid system. The aid forms may include an auction mechanism, various feed-in premiums, and a call for bids procedure specific to CHP installations. The aid mechanism depends on the installation's capacity and the fuel used by the installation. In the course of several proceedings conducted in connection with the aid provided for under the Polish legislation, the European Commission has already conducted several proceedings in which particular aspects of the support scheme were assessed as compliant with the internal rules of the market.

From the perspective of the research problem of this article, the most important is how the European Commission addressed procedural issues. Poland did not notify aid measures. While in the case of the measures introduced in 2007, which were the first support measures for this type of installations provided for in the Polish legal system, the omission of the procedure could have been justified. However, subsequent

modifications of the system and support for other installations with generation capacity exceeding 300 MW should have been notified. In its decisions on state aid, the European Commission only pointed to procedural shortcomings. It should be reiterated here that the non-notification of an aid measure in respect of which a Member State has the slightest suspicion that there are grounds for suspecting that it may constitute state aid raises the presumption that the condition of the prohibition of state aid concerning the effect on trade between the Member States has been breached. It can, therefore, be assumed that in the case of the Polish support scheme for cogeneration installations, the European Commission was exceptionally lenient in addressing the procedural shortcomings on the part of Poland.

3. Conclusions and Implications

In our opinion, the European Commission's lenient treatment of Poland concerning the implementation of energy support schemes may result from the need to increase the rate of RES installation proliferation in Poland, thus implementing the EU energy and climate policy in the area of energy efficiency. Therefore, the state aid mechanism could play the role that has already been indicated, i.e., motivating a Member State to take measures aimed at the faster transformation of its energy sector (Dezobry and Hauteclocque, 2018).

The solutions regarding compensation for PPAs are unique on a European scale. This is the consequence of Poland's historical determinants and Poland's accession to the European Union. From the very beginning, the solution addressing the PPA issue was intended to be temporary and only local.

The support scheme for RES-E producers in Poland has been transformed from a specific scheme of certificates of origin to an auction scheme based on the existing European solutions (Przygodzki, 2019). This reform is intended to address the shortcomings of the green certificate-based scheme and introduce the long-term stability of nominal return on investment necessary for investors. The introduced change in the RES support scheme may attract international investors who are already familiar with such a support structure from Western European energy markets.

The relatively latest support schemes for cogeneration and the power market were introduced based on existing European solutions (Gurgacz and Jarosiński, 2020). An assessment of the effectiveness of the implemented solutions in Poland is not possible at this point, as they have been in operation for too short a period.

The free allocation of carbon allowances within the EU Emissions Trading System remains a fundamental question. In the authors' opinion, the forecasted increase in the prices of the said allowances is and will soon remain the biggest problem for the Polish energy sector as it is too firmly based on the combustion of hard coal and lignite. The free emissions allowances were intended to support the transformation of the manufacturing sector in Poland. In hindsight, however, we can see that the hopes

placed in this solution have not been fulfilled, and the problem of rising prices of allowances is getting worse (Przygodzki, 2019).

Based on the analysis of legal sources regarding Polish support measures for RES installations, the deliberations in this article indicate that the Polish legislator adopted in principle regulations to support the construction of new RES installations in the period from the mid-1990s to 2020. Incentives undertaken under the Polish legislation have taken different forms of state aid, but it cannot be concluded that the Polish state has not taken any actions supporting RES installations. Individual acts introduced increasingly new regulations to encourage entrepreneurs to invest in RES installations.

A phenomenon that occurred between 2016 and 2018 involved adopting an amendment to the Wind Farm Investment Act, which, due to the introduction of the 10H rule, essentially blocked the development of the most popular category of RES installations, i.e., wind power. The 10H rule states that it is not possible to locate new wind farms within a distance of ten times the turbine's height, including blades from residential buildings. As a result, it turned out that there were no sites in Poland meeting this premise. It was only with the adoption of government programs supporting photovoltaics in 2018 that Poland could return to the path taken by countries with an increasing number of RES capacities.

The analysis of the described legal sources indicates that in the period until 2015, there were indeed some forms of favoritism towards selected categories of RES installations. Such a theorem can be made for wind power, as the KPI scheme regulation reveals. However, there is no doubt that photovoltaic installations have been strongly supported since 2018, which is demonstrated, for example, by the government support program for prosumers, i.e., individual electricity suppliers.

However, the support measures for RES laid down in Polish law, as indicated in the article, do not come together under a common umbrella. There is no comprehensive regulatory framework that would consider both the conditions for supporting the construction of new RES installations and the conditions for using these installations. Support for constructing new installations appears to constitute a form of ad hoc policy, which is confirmed, for example, by the government support to photovoltaics after 2018, the Wind Farm Investment Act, or regulations relating to cogeneration installations. The regulations on the energy trading market look much better in terms of cohesion. After a period of dynamic changes, the auction mechanism has finally been consolidated, which provides a sure guarantee for energy enterprises operating on the RES-E trade market.

A context analysis relating the individual support measures for RES adopted in Poland to the regulations of the EU law provides an answer to the research question concerning the risk of challenging Polish support measures for RES. Given the approval of the Polish auction mechanism by the European Commission, the risk that it will be challenged is low unless changes are made to support the position of selected

power enterprises. A context analysis also supports the theorem that the development of new RES installations requires state support, and therefore the state aid mechanism is necessary for the existence and establishment of new RES installations in Poland. Therefore, if Poland wishes to implement the assumptions laid down in the European Green Deal, it is necessary to adhere to the EU regulations adopted in this regard strictly. If Polish RES support regulations are challenged on state aid mechanism interpretation grounds, this will likely delay implementing decarbonization and climate neutrality objectives of the European Green Deal in Poland. New RES installations are unlikely to be built in Poland without state aid measures.

We used the above considerations to formulate a forecast for the Polish energy policy concerning the support mechanism available to RES in the coming years. The stabilization of the RES electricity trading system under the auction mechanism will encourage more entrepreneurs to invest in RES. However, it is currently impossible to assess to what extent this increased involvement will translate into the construction of new RES installations. The auction mechanism guarantees the use of existing RES installations but does not necessarily lead directly to the installation of new ones. Due to the strong involvement of the state in providing support for photovoltaic installations, it seems that small investors installing photovoltaic panels within their households will bear the main burden of responsibility for the development of new RES installations in Poland.

There is still no large-scale support program for power enterprises currently operating on the Polish market, stimulating them to increase investment in new RES installations. Admittedly, support for cogeneration installations is a manifestation of such measures, but cogeneration merely optimizes the operation of conventional power stations and translates into CO₂ re-education, but not into the increased production of 'green energy. Such support operated under the Wind Energy Investments Act until 2015, but it has been suspended since 2016. Since the energy policy of the European Union requires an increase in the production of RES-E, Poland still faces the challenge of adopting such legal regulations that would encourage power enterprises to invest in this sector on a larger scale. Temporary government support in the form of subsidies for individual photovoltaic installations will not solve the problem.

References:

- Ambroziak, A., Pamuła-Wróbel, K., Zenc, R. (Eds.). 2020. State aid for entrepreneurs. Selected issues. Wolters Kluwer, Warszawa.
- Amending the Renewable Energy Sources Act and certain other acts. 2018. Journal of Laws, item 1276.
- Amending the Renewable Energy Sources Act and certain other acts. 2019. Journal of Laws, item 154.
- Council of Ministers. 2020. Regulation of the of 31 December 2019 on the Maximum Quantity and Value of Electricity from Renewable Energy Sources that may be Sold by Auction in 2020. Journal of Laws, item 101.

- Dezobry, G., Hauteclouque, A. 2018. State Aid and Price Regulation in the Energy Sector. In: Hancher, L., Hauteclouque, A., Salerno, F.M. (Eds.), *State Aid and the Energy Sector*. Hart Publishing, Portland, 78-131.
- European Commission Press Release. 2017. Polish Renewable Energy Support Scheme Approved. Retrieved from: https://ec.europa.eu/commission/presscorner/detail/pl/IP_17_5261.
- European Commission. 2009. Decision of 25 September 2007 - 2009/287/EC - on state aid granted by Poland as part of PPAs and the state aid which Poland is planning to implement as compensation for the voluntary termination of Power Purchase Agreements. Official Journal of the European Union, L 83.
- European Commission. 2012. Decision concerning the application pursuant Article 10c (5) of Directive 2003/87/EC of the European Parliament and the Council to give transitional free allocation for the modernization of electricity generation notified by Poland under Article 10c(5) of Directive 2003/87/EC of the European Parliament and of the Council for transitional free allocation of emission allowances for the modernisation of electricity generation. Retrieved from: [https://www.kobize.pl/uploads/materialy/prawo/akty_prawne UE/decyzja.DG.CL IM.C\(2012\)4609.pdf](https://www.kobize.pl/uploads/materialy/prawo/akty_prawne UE/decyzja.DG.CL IM.C(2012)4609.pdf).
- European Commission. 2014. Decision - SA.34674 (2013/N) - Derogation under Article 10c of Directive 2003/87/EC on Emissions Trading - Free Allowances for Electricity Generators. Retrieved from: [https://www.kobize.pl/uploads/materialy/prawo/akty_prawne UE/decyzja.DG.COMP.C\(2013\)6648.pdf](https://www.kobize.pl/uploads/materialy/prawo/akty_prawne UE/decyzja.DG.COMP.C(2013)6648.pdf).
- European Commission. 2016. Decision SA.37345 (2015/NN) - Polish System of Certificates of Origin to Support Renewable Energy Sources and Reduce the RES Burden for Energy-Intensive Consumers. Official Journal of the European Union, C 471.
- European Commission. 2016a. Decision SA.36518 (2016/NN) on Certificates of Origin for High-Efficiency Cogeneration Generators. Official Journal of the European Union, C20.
- European Commission. 2018. Decision of 7 February 2018 - SA.46100 (2017/N) – Polish capacity mechanism. Official Journal of the European Union, C462.
- European Commission. 2019. Decision SA.50305 - Plock 600MW CCGT. Official Journal of the European Union, C14.
- European Parliament. 2003. Directive of the European Parliament and of the Council of 13 October 2003 - 2003/87/EC.
- European Parliament. 2012. Directive of the European Parliament and of the Council of 25 October 2012 - 2012/27/EU - on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. Official Journal of the European Union, L315.
- European Parliament. 2012a. Directive of the European Parliament and of the Council of 25 October 2012 - 2012/27/EU - on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. Official Journal of the European Union, L315.
- Gabryś, H.L. 2020. Power industry in Poland in 2020...as it now and what next. *Energetyka*, 2, 59-85.
- Gurgacz, S., Jarosiński, M. 2020. Who and whether at all, profits from cogeneration? *Energetyka*, 8, 398-409.

- Kazanowski, A. 2020. State aid for environmental protection. In: Ambroziak, A., Pamuła-Wróbel, K., Zenc, R. (Eds.). *State aid for entrepreneurs. Selected issues.* Wolters Kluwer, Warszawa, 200-234.
- Law on the Greenhouse Gas Emission Trading Scheme of 12 June 2015. 2015. In *Journal of Laws*, item 1223.
- Minister for Energy. 2019. Regulation of the of 15 May 2019 on the Reference Price of Electricity from Renewable Energy Sources in 2019 and the Periods Applicable to Generators that Won the Auctions in 2019. *Journal of Laws 2019*, item 1001.
- Minister for Energy. 2019a. Regulation on the Maximum Quantity and Value of Electricity from High-Efficiency Cogeneration Granted Support and the Unit Amounts of the Feed-in Premium in 2019 and 2020. *Journal of Laws 2019*, item 1671.
- Minister for Energy. 2019b. Regulation on the Method of Calculating the Data Provided to benefit from the Support Scheme and the Detailed Scope of the Obligation to Confirm Data on the Amount of Electricity from High-Efficiency Cogeneration. *Journal of Laws 2019*, item 1851.
- On the Promotion of Electricity from High-Efficiency Cogeneration of 14 December 2018. 2019a. *Journal of Laws*, item 42.
- Przygodzki, M. 2019. Economics and system development of power industry. *Energetyka*, 3, 51-58.
- Renewable Energy Sources Act. 2015. *Journal of Laws*, item 478.
- Stoczkiewicz, M. 2011. *State Aid for power enterprises in the law of the European Union*, Wolters Kluwer, Warszawa.
- Tempus Energy Germany and Tempus Energy Sweden against European Commission on the Polish Capacity Market. 2019. *Official Journal of the European Union C*.