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PROVIDING SUSTAINABLE ENERGY IN POLAND IN COMPARISON TO THE EUROPEAN UNION IN LIGHT OF THE SEVENTH GOAL OF THE 2030 AGENDA

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ABSTRACT: Purpose – is to answer the research question: what is the speed of ensuring access to sustainable energy in Poland in comparison to the average speed in the EU-28 in the context of the seventh goal of the 2030 Agenda, as well as an analysis of Poland's accomplishments in this field. The study made use of available statistical data related to the eight primary indicators of the Sustainable Development Goals (SDGs) reported by Eurostat and established by the UN. The time frame considered was 2010-2016. Methodology – analysis of dynamic indicators, analysis of real variables or percentages depending on the available data, comparative analysis, and a scale of positive assessments reflecting accomplishments. Implications – the speed of change in Poland is slower than in the rest of the EU. In light of the speed and level of achievements in providing sustainable energy in Poland and the EU, one can indicate tasks/areas requiring more intensive action in the context of the seventh goal of the 2030 Agenda.

KEY WORDS: sustainable development; sustainable energy; society; Poland; European Union

Introduction

It is likely that no one still needs to be convinced of the importance of energy security for society (creating access to varied energy sources for all people) and increasing energy efficiency in all economic sectors (including the domestic sector) in the European Union, in individual countries, and on a global scale. The level of the problem is highlighted by the fact that, in December 2011, the United Nations General Assembly declared the year 2012 to be the International Year of Sustainable Energy for All. It was declared thus because access to modern energy services at affordable prices in developing countries is imperative for achieving the Millennium Development Goals and the concept of sustainable development. During the assembly, the Secretary-General, with the support of UN-Energy and the United Nations Foundation, took charge of the new global initiative entitled "Sustainable Energy for All". Ensuring energy supply was not a separate goal in the Millennium Declaration, but it was stated that its contribution is key to achieving most of its objectives (there is a strong correlation between energy and human development), which is why its importance was raised by taking this initiative (The Energy..., 2005, p. 1-17; The Future..., 2012; Nilsson et al., 2013, p. 4124-4151). Within this initiative, governments, the private sector, and representatives of civil societies around the world would cooperate to realize three main goals relating to general access to sustainable energy by the year 2030. These goals are (Kryk, 2012, p. 151; The Millennium, 2015):

- providing general access to affordable, reliable, and modern energy services,
- considerably increasing the use of renewable energy in the global energy mix (actions in this area are conducted very unevenly, and their effects are also smaller and slower than expected) (Miłek, 2012, p. 19-40; Wamsted, 2013, p. 22-29),
- doubling the speed of improving energy efficiency (the underlying meaning of this goal through the use of the word "doubling" should be noted, as it means that the speed of increasing energy efficiency up until this point was insufficient in comparison to expectations, and actions leading to this increase should be intensified).

These goals, because they were not realized (Sachs, 2012, p. 2206-2211; EC, 2013; UN, 2015), were reiterated as goal 7 of the 2030 Agenda (seventh goal is to "ensure access to affordable, reliable, sustainable and modern energy for all") – they were indicated in order as tasks 7.1, 7.2, and 7.3. Two more tasks were also added, namely:

- 7a. To increase, by 2030, international cooperation allowing access to research on clean energy and technology related to renewable energy and energy efficiency, and advanced and cleaner fossil fuel technology, as well as promoting investment in energy infrastructure and cleaner energy technologies,
- 7b. To expand infrastructure and modernize technology allowing access to modern and sustainable energy services for all residents of developing countries by 2030, especially the least developed countries, small developing island countries, and developing inland countries, according to their development programs.

The tasks of the seventh goal of the 2030 Agenda are convergent with the energy politics goals of the European Union, both from 2007 (EC, 2007) and the current one presented in Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy (EC, 2015), the Europa 2020 Strategy (EC, 2010) and in a document *Clean Energy For All Europeans* (EC, 2016), containing a package of measures to maintain the competitiveness of the European Union at a time when the transition to clean energy is changing global energy markets, which promotes their realization in EU countries. Poland, as a member of the EU and a signatory of the New Agenda, is obliged to realize them as well. It follows, then, that it is worth examining what the current situation in this regard is. Thus, the aim of this article is to answer the research question: what is the speed of ensuring access to sustainable energy in Poland in comparison to the average speed in the EU-28, as well as an analysis of Poland's accomplishments in this field, in the context of the seventh goal of the 2030 Agenda. In order to answer this, statistical data related to the eight indicators of the SDG 7 reported by Eurostat and established by the UN were analysed. The beginning of the considered time period was 2010, when, in the UN report "The Global Partnership for Development: Time to Deliver" (UN, 2011, p. 8-10), information was provided on the difficulties in supplying energy to a large portion of the Earth's population. This information was the basis for formulating the above-mentioned opinion of the UN in 2011 regarding the necessity for increasing efforts to provide greater access to energy, as well as the seventh goal of the New Agenda, which is the topic of discussion of this article. The end of the considered time period (2016) is marked by the end of the available data. Because of the relative newness of the Agenda, the following article stands as a supplement to the perceived research gap, and the analytical method used broadens the spectrum of experimental methodology. The conducted research allowed conclusions to be formulated regarding the current achievements of Poland in this field and the necessary directions of change.

Research methods

Objective 7 of Agenda 2030 – providing everyone with access to stable, sustainable and modern energy at an affordable price – reflects a new multi-faceted view on the issues of energy supply and the energy sector. According to the aforementioned document, ensuring sustainable energy does not only refer to increasing the share of energy from renewable sources in final gross energy consumption, but to treat this issue and the energy sector in a broader perspective than before. It is necessary to take into account other economic and social variables determining the implementation of the objective, which is why the number of indicators to illustrate this has been increased.

In order to monitor achievements in the realization of the seventh goal of the 2030 Agenda of the UN, eight indicators were used (primary energy consumption, final energy consumption, final energy consumption in households *per capita*, energy productivity, share of renewable energy in gross final energy consumption by sector, energy dependence by product, population unable to keep home adequately warm by poverty status, greenhouse gas emissions intensity of energy consumption). For most of these indicators, no reference levels or benchmarks were set, but rather it was established, that the levels of these indicators should be improved. Firstly, in order to identify the state of Polish achievements in comparison to the EU regarding access to sustainable energy, dynamics and actual or percent values of the measured indicators were analysed, and then – taking into account the speed and direction of changes – a synthetic evaluation of achievements toward the seventh goal thus far was performed. For this evaluation, the following scale was used: unsatisfactory (+), moderately satisfactory (++), sufficiently satisfactory (+++), fully satisfactory (+++). The higher the level of indicators accomplished and the faster the speed of these changes, the higher the evaluation (tables 1-8).

Results of the research and Discussion

The realization of the SGDs requires primary energy consumption, which is also one of the significant goals of the 2007 energy and climate package (the so-called “3×20%”) in the EU. Although the data from Table 1 reveals that this has occurred rather slowly in Poland. Periods of decline intertwined with periods of growth (this trend was similar to the EU trend), which is likely linked to the economic situation. Altogether, over six years, the use of this energy decreased by 1.5 percentage points (pp) and was 5.4 pp lower than the EU average. The speed of decreasing the use of primary energy also

decreased fourfold: in Poland, it was 0.3 pp/year, and in the EU it was 1.2 pp/year. Although in percentages the effects on a national scale were not satisfactory, they were moderately satisfactory on the scale of the entire EU. However, the actual values should be noted. In Poland, a change of 1 pp = 0.93 million TOE, and in the EU 1 pp = 16.64 million TOE. Thus, it can be said, that the overall amount of unused energy – 1.4 million and 114.8 million TOE respectively – led to a saving of energy. A rise in energy productivity added to this (in Euro/KGOE – table 4), which led to an increase in energy efficiency both in Poland and in the EU (Energy, 2017, p. 17-18). In the end, the synergistic effect was more satisfactory, but still less than expected. Indeed, in economic forecasts (The EU..., 2014) and scientific studies it was determined that in order to achieve the goal, it would be necessary to reduce primary energy consumption by an average of 6.3% per year (Skoczkowski, Bielecki, 2016, p. 5-20; Pach-Gurgul, 2015, p. 75-90). With the current rate of change, the goal may not be reached.

Table 1. Primary energy consumption [million tonnes of oil equivalent – TOE]

Specification	2010	2011	2012	2013	2014	2015	2016	Dynamic 2016/2010	Change	Evaluation
EU 28	1657,5	1595,4	1586,1	1571,2	1508,6	1531,9	1542,7	93,1	-6,9 pp Average -1,2/r	++
Poland	95,7	95,8	92,7	93,0	89,2	90,0	94,3	98,5	-1,5 pp Average -0,3/r	+

Source: author's own work based on Eurostat.

The limitations also require final energy consumption, which in Poland decreased between 2010-2014, what was related to the then economic crisis, but in 2015 it began to rise again, and in 2016 it was 0.6 pp greater in comparison to the beginning of the studied time period (table 2). This was connected to a large extent to an increase in economic activity, improvement of living conditions and lifestyle (a majority of appliances and products require the use of electric energy, a few runs on batteries), and to a lesser extent of structural changes (the “structure effect”) and weather conditions (Energy, 2017). This trend confirms economic forecasts indicating an increase in energy consumption in the EU in the perspective up to 2030 and beyond. The average annual speed of increase was 0.1 pp, and the direction of change was the opposite of the intended direction, so the effect was unsatisfactory. Simultaneously, this indicates the necessity for finding new solutions for decreasing energy intensity, which would satisfy energy requirements without

a greater energy expenditure. In the EU, the final energy consumption decreased between 2010-2015 and only rose in 2016. This resulted in an overall decrease of 4.8 pp from 2010. The annual average decreased by 0.8 pp. Considering percentages, the overall change in the EU was nine times greater than in Poland, which is a rather satisfactory result in the context of the SDGs.

Table 2. Final energy consumption [million tonnes of oil equivalent – TOE]

Specification	2010	2011	2012	2013	2014	2015	2016	Dynamic 2016/2010	Change	Evaluation
EU 28	1163.2	1109.2	1108.5	1108.2	1063.1	1086.2	1107,7	95.2	-4,8 pp Average -0,8/r	+++.
Poland	66.3	64.7	64.4	63.3	61.6	62.3	66.7	100,6	0.6 pp Average 0.1/r	+

Source: author's own work based on Eurostat.

Poland had better results in the area of final energy consumption in households *per capita*, which decreased by 9.9 pp over six years (table 3). The annual average dropped by 1.6 pp, which is equivalent to 35.6 kg of oil, and was 2.5 kg of oil equivalent less than 1 pp in the EU (38.1 kg). In a situation where the level of final energy consumption in households *per capita* was consistently lower than the EU average, this could be considered a satisfactory result in the context of the SDGs, although the speed of change in Poland was 0.6 pp slower than in the EU.

Table 3. Final energy consumption in households *per capita* [kg of oil equivalent]

Specification	2010	2011	2012	2013	2014	2015	2016	Dynamic 2016/2010	Change	Evaluation
EU 28	635	565	589	595	522	543	558	87,9	-12,1 pp Average -2,02/r	+++
Poland	577	528	545	537	498	498	520	90.1	-9.9 pp Average -1.6pp	+++

Source: author's own work based on Eurostat.

The indicator of energy productivity shows how many euros are earned by saving 1 kilogram of oil equivalent (KGOE). The higher this indicator, the better. In Poland, as in other countries which joined the EU in the twenty-first

century, energy productivity was lower than the EU average (around 3.9 euro/KGOE) during the entire time period considered (table 4). The average speed of increase was higher than the EU, as it reached 3.2 pp/year, whereas the EU's was 2.5 pp/year (this could have been linked to the weaker impact of the last financial-economic crisis on the Polish economy). Thanks to this, energy productivity rose by 19.4 pp and was 4.3 pp higher than the EU average (15.1 pp). Despite this, there is still almost two times higher of a value generated by 1 KGOE in the EU (8.4 euro) than in Poland (4.3 euro in 2016), therefore the results were evaluated as moderately satisfactory in the context of the seventh goal of the 2030 Agenda. This also indicates the necessity of finding new ways to increase energy productivity. This is even more important because it affects energy efficiency.

Table 4. Energy productivity

Specification	2010	2011	2012	2013	2014	2015	2016	Dynamic 2016/2010	Change	Evaluation
EU 28	7.3	7.7	7.7	7.8	8.3	8.3	8.4	115.1 Average 2.5/r1.1 Average 2.5/r	15.1 pp Average 2.5/r	++
Poland	3.6	3.8	4.0	4.0	4.3	4.4	4.3	119.4	19.4 pp Average 3.2/r	++

Source: author's own work based on Eurostat.

A vital role in providing sustainable energy is played by renewable energy sources (RES), which should largely replace traditional sources. The indicator of shares of renewable energy in gross final energy consumption by sector is used for monitoring this, and this indicator rose both in the EU and in Poland during the considered time period, although at different speeds (table 5). In Poland, the indicator rose from 9.3% in 2010 to 11.3% in 2016, in other words, by 2 pp in six years. The average rose by 0.3 pp in a year, although the yearly increases were lower. The change in direction in Polish energy policy in the field of energy supply has hindered the development of RES (the Polish government assumed that hard coal mining is and will be the basis for the energy balance of the state in the coming years) (Bojanowicz, 2017, p. 6-7; Uznański, 2018, p. 6-7; Energy Policies, 2017), which could lead to a failure to achieve a 15% share of renewable energy in the final energy consumption, originally planned for 2020. This also has a negative impact on the realization of the Europa 2020 Strategy, 2030 Agenda goals and Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy (EC, 2015).

This is all the more disadvantageous because at all times the indicator of shares of renewable energy in gross final energy consumption by sector in Poland was at a lower level (on average, 4.2 pp lower) than in the EU. The average speed of change of this indicator in the EU was 0.8 pp/year and was 2.7 times higher than in Poland, thanks to which the amount of RES in the final energy consumption by sector rose by 17% in 2016 (by 5% pp). If the rate of change of this indicator does not decrease, the planned level of the examined indicator in the EU will be achieved – 20% in 2020 and 27% in 2030 thanks to the positive effects of actions of other community members in this regard (EC, 2016). The RES share is projected to even increase to 30% in the EU. The reason for this is the recent decline in the costs of renewable technologies. EU commissioner Maroš Šefčovič estimates that achieving the 30% target by 2030 will cost almost as much as 27% previously adopted (EC, 2017). Summing up, in the context of Poland's goal 7, Poland's achievements in this respect are unsatisfactory and the EU quite satisfactory.

Table 5. Share of renewable energy in gross final energy consumption by sector [%]

Specification	2010	2011	2012	2013	2014	2015	2016	Changes	Evaluation
EU 28	12.0	13.2	14.4	15.2	16.1	16.7	17.0	5 pp Average 0.8 pp/r	+++
Poland	9.3	10.3	10,9	11.4	11.5	11.7	11.3	2 pp Average 0.3pp/r	+

Source: author's own work based on Eurostat.

Providing access to clean, sustainable, and modern energy, along with energy security, is not always possible based only on a country's own natural resources or energy production. Some of the EU member states (including Poland) must import appropriate fuel (less harmful to the environment) or energy in order to limit pollution of the natural environment (Sakowska, 2017, p. 11-19). Thus, it is important to research the level of energy dependence by-product, which reflects the impact of importing on overall energy usage. In 2010, the EU reached 52.7% of this indicator, and over six years, it rose by 0.9 pp to 53.6%, for an average of 0.15 pp annually—which could be considered to be not very much (table 6). This is certainly the case from an environmental perspective: increasing the importing of more ecological fuels or buying pre-generated energy is less harmful to the environment. However, for the country's economy, importing requires more reliance on external sources, which could lead to risks related to punctual delivery or an increase in energy supply prices due to using less polluting fuels not owned by the

country. These arguments are cited by the Polish government in answer to their use of national fossil fuel resources. This could be one of the reasons for the decline in the share of fuel imports in total energy consumption in Poland from 31.3% in 2010 to 30.3% in 2016, which may be detrimental to the environment. One cannot, however, discard the relationship of this indicator to the increase in energy efficiency caused by technological changes, and this is precisely what occurred. Increasing energy efficiency is determined by a decrease in energy usage as well as a decrease in energy import. Regardless of the causes, the decrease in energy dependence by-product in Poland by 1 pp over 6 years (on average 1.17 pp/year) is not satisfactory. Moreover, it should be noted that over the entire time period studied, this indicator was lower in Poland than the EU average (around 23.6 pp), which means less dependence of the country on external providers, and the direction of change of the indicator is appropriate from the perspective of ensuring energy security.

Table 6. Energy dependence by-product [% of imports in total energy consumption]

Specification	2010	2011	2012	2013	2014	2015	2016	Changes 2016/2010	Evaluation
EU 28	52.7	54.0	53.4	53.1	53.4	53.9	53.6	0,9 pp Average 0.15/r	+
Poland	31.3	33.4	30.6	25.6	28.6	29.2	30.3	-1 pp Average -0.17/r	+

Source: author's own work based on Eurostat.

Another indicator reflecting the implementation of SDG 7 is the indicator of the population unable to keep home adequately warm by poverty related to the measurement of fuel poverty and reflects the percentage of all residents who are not able to maintain an adequate level of heat in their homes. According to the World Health Organization, the temperature of 21°C in the living room and 18°C in the other rooms can be considered as comfortable (Ormandy, Ezratty, 2012, p. 116-121). The concept of fuel poverty relates to the problem of maintaining an appropriate (comfortable) temperature in the home. The causes of this are three key factors: high energy costs, energy inefficient homes, and relatively low household income. Thus, poverty is associated with a lack of financial resources, for the purchase of energy and energy services (in the UK it is assumed that it occurs when the household spends more than 10% of its income on heating the house to the appropriate temperature) (Moore, 2012, p. 19-26; Liddella et al., 2012, p. 27-32; Waddams,

2012, p. 19-26). The result of this state is a cold and damp home, which has a negative impact on the health and well-being of its residents (sick building syndrome). From the definition, it can be stated that not all “impoverished” homes are also “energy impoverished”, although the probability of fuel poverty rises in correlation with decreasing income. Often, the victims of fuel poverty are the poorest families who live in buildings using the most energy. These families are punished twice over: by a poor standard of living, and by high energy bills. However, belonging to non-impoverished households does not automatically eliminate such a household from fuel poverty. This results from one simple fact—fuel poverty occurs not only where income is low, but also where a combination of three factors occur: low income, low housing quality, and high energy costs” (Szamrej-Baran, 2013, p. 151-152; Darby, 2012, p. 98-106; Thomson, Snell, 2016, p. 101-118).

In Poland, at the beginning of the studied time period, 14.8% of the population were living in fuel poverty, which was 5.3 pp more than in the EU, whereas in 2016 it affected only 7.1% of residents (table 7). Over six years, the indicator of the population unable to keep home adequately warm by poverty was constantly decreasing: whereas by 2013 it was higher than the EU (on average by 3.1 pp), in 2014 it was the opposite case. In 2016, it was lower in Poland by 1.7 pp than in the EU, and 52% lower than in 2010. The decrease in this indicator was linked to, among others, the improvement of the Polish economy, which impacted the increase in wealth of the population and limited the amounts of extreme and relative poverty in all social groups. In the EU—due to the inclusion in 2007 of Bulgaria and Romania (the poorest countries in the group)—this indicator initially rose, and only started to decrease in 2013, when the average speed of change was around -0.13 pp/year, and was almost 10 times lower than the average speed of change in Poland (-1.28 pp/year). In effect, this indicator decreased in the EU by 1.1 pp overall (unsatisfactory – the results of research in this respect in relation to the EU coincide with the results presented in the literature on the subject) (Tirado Herrero et al., 2012, p. 60-68; Świerszcz, Grenda, 2018, p. 211-230), and in Poland by 7.7 pp (which was 52%), a sufficiently satisfactory result. Thanks to this, the number of people in Poland living in fuel poverty decreased by 48%.

Implementation of SDG 7 also requires reduction of greenhouse gas emissions. According to the EU climate and energy policy, Member States are obliged to reduce greenhouse gas (CO₂) emissions by 40% by 2030 and by as much as 80% by 2050 compared to 1990 levels (EC, 2013; EC, 2011). The proposed target for Poland (reduction of CO₂ by 7%) is one of the lowest in the EU (the same is to be achieved by Croatia and Hungary, with lower reduction targets only for three countries – Latvia (6%), Romania (2%) and Bulgaria (0%).

Table 7. Population unable to keep home adequately warm by poverty status [% of the population]

Specification	2010	2011	2012	2013	2014	2015	2016	Changes 2016/2010	Evaluation
EU 28	9.5	9.8	10.8	10.7	10.3	9.4	8.7	-0.8 pp Average -0.13 pp/r	+
Poland	14.8	13.6	13.2	11.4	9.0	7.5	7.1	-7.7 pp Average -1.28 pp/r	+++

Source: author's own work based on Eurostat.

In the studied time period, the indicator of greenhouse gas emissions intensity of energy consumption decreased in both Poland and the EU, but at different speeds (table 8). In the EU, it decreased on average by 0.78 pp/year, which resulted in a decrease in greenhouse gas emissions by 4.7 pp. The rate of change of this indicator was not significantly higher than in the years 2000-2009 (0.71 pp/year) (author's calculations based on Eurostat data), but despite this, the realization of one of the EU's climate policy goals by 2030 – the limiting of at least 40% of greenhouse gas emissions based on the levels from 1990 – is questionable. Thus, the achieved result is moderately satisfactory. In Poland, the indicator decreased by an average of 0.45 pp/year, or 1.7 times slower than in the EU. This allowed for a decrease in greenhouse gas emissions by only 2.7 pp, and this is not a satisfactory result. What is worse, the situation may not improve, as it is predicted that fossil fuels will dominate the energy market until 2035 or even until 2050. This could lead to an increase in greenhouse gas emissions through energy usage. Therefore, accomplishing the EU energy policy goals and the 2030 Agenda requires taking appropriate steps in order to increase the speed of limiting greenhouse gas emissions.

Table 8. Greenhouse gas emissions intensity of energy consumption

Specification	2010	2011	2012	2013	2014	2015	2016	Changes 2016/2010	Evaluation
EU 28 index (2000 = 100)	92.6	92.4	92.0	90.7	89.3	89.1	87.9	-4.7 pp Average -0.78pp/r	++
Poland index (2000 = 100)	93.0	91.9	93.9	91.9	91.4	91.4	90.3	-2.7 pp Average -0.45 pp/r	+

Source: author's own work based on Eurostat.

Taking into account the individual evaluations of achievements for each indicator, a synthetic evaluation was performed, summing up the amount of (+) awarded. Table 9 presents the amount of possible (+) that could be gained, and table 10 presents the evaluation of the effects so far.

Table 9. Number of pluses possible to achieve

Evaluation	Possible amount of points to be gained
Unsatisfactory (+)	1-8
Moderately satisfactory (++)	9-16
Sufficiently satisfactory (+++)	17-24
Satisfactory (++++)	25-31

Source: author's own work based on Eurostat.

Table 10. Synthetic evaluation of achievements in the context of the SDGs

Specification	Sum (+)	Sum (++)	Sum (+++)	Sum (++++)	Total sum of (+)
Poland	6	0	6	0	12
EU 28	3	4	9	0	16

Source: author's own work based on Eurostat.

Based on the findings above, conclusions were drawn, which are presented below.

Conclusions

During the studied period:

- The combined effects of Poland and the EU as measured by the SDGs were assessed as moderately satisfactory, and the achievements of Poland were smaller than the EU's.
- In Poland, the speed of change of five of the goals (1, 2, 5, 6, 8) was unsatisfactory, and two were sufficiently satisfactory (3, 7), whereas, in the EU, the speed of change of three of the goals (4, 6, 7) was unsatisfactory, two were moderately satisfactory (1, 8), and three were sufficiently satisfactory (2, 3, 5).

In summary, Poland's effort to realize the seventh goal of the 2030 Agenda must increase in the speed of change in almost all areas measured by the aforementioned indicators. This will require not only a search for new solu-

tions or instruments allowing them but also an increase in the level of education regarding sustainable development and changes in the development of sustainable energy. In the EU, the situation in this area is better, but specific actions are still needed, which are formulated in the A framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy of 2015.

Poland as an EU member is obliged to participate in the implementation of energy goals. The EU objectives that should be achieved by 2030 are: reduction of greenhouse gas emissions by 40% (as already mentioned – for Poland only a 7% reduction is foreseen in this case), share of energy from renewable sources in total energy consumption – 27% (20% for Poland), improvement of energy efficiency by 27-30%, 15% of energy in interconnections (i.e. 15% of electricity generated in the EU can be sent to other EU countries). Their achievement is to be supported by new regulatory proposals related to the new vision of the energy market contained in the mentioned Clean Energy For All Europeans package (EC, 2016), accompanying the strategy for the Energy Union, which, inter alia, they assume equal treatment of energy sources, efficient management of energy demand and supply, shaping energy prices on an arm's length basis, guaranteeing the possibility of producing and storing energy for prosumers and energy cooperatives, strengthening competitiveness of the energy market. Most of the proposed solutions have not yet been included in Polish legal regulations, as the last strategic document called Energy Policy of Poland until 2030 comes from 2009, and the draft "Energy Policy of Poland until 2040" developed by the previous Government since 2015 has not yet been finalized (Projekt..., 2018). The Act on Renewable Energy Sources adopted by the new Government (Ustawa, 2015), pointing to a change in national energy policy (return to hard coal as a basis for energy security) adversely affected the RES development, resulting in a slowdown in the development of renewable energy and a threat of failure to achieve in this regard. It can also determine the implementation of other goals. The International Energy Agency (IEA) pointed out this in the Report on the energy situation in Poland (Energy Policies of IEA, 2017). However, it should be emphasized that according to the IEA report, Poland does not fully support the "transformation of the energy system", putting still on fossil fuels as the basic element of the energy system in the long-term perspective. Nevertheless, it places great emphasis on reducing greenhouse gas emissions (GHG) and air pollution, improving energy efficiency, meeting renewable energy targets, decarbonising the transport system and introducing nuclear energy.

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