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EFFECT OF INTERNATIONAL AGREMENTS CONCERNING THE CLIMATE PROTECTION ON THE ENERGY POLICY OF POLAND

WPŁYW POROZUMIEŃ MIEDZYNARODOWYCH DOTYCZĄCYCH OCHRONY KLIMATU NA POLITYKĘ ENERGETYCZNĄ POLSKI

Summary: *In the paper, the effect of the recommendations of the international communities, connected with the promotion of the idea of the necessity to protect climate and counteracting the global warming on Polish environment-friendly solutions, as implemented by the Polish Government and the related legislation have been presented. Also, the project of developing the assurance of the energy security of Poland in aspect of international agreements, aiming at the reduction of GHG (greenhouse gases) emissions and counteracting the unfavourable climate changes has been discussed..*

Keywords: *global climate changes, greenhouse gases (GHG) emission, energy policy, energy security of Poland, environment-friendly legislation*

Streszczenie: *W pracy przedstawiono wpływ zaleceń społeczności międzynarodowej związanych z propagowaniem idei konieczności ochrony klimatu oraz przeciwdziałaniu globalnemu ociepleniu na polskie rozwiązania proekologiczne realizowane przez rząd polski i związane z nim ustawodawstwo. Omówiono również projekt rozwoju zapewnienia bezpieczeństwa energetycznego polski w aspekcie porozumień międzynarodowych mających na celu zmniejszenie emisji gazów cieplarnianych i przeciwdziałaniu niekorzystnych zmian klimatycznych.*

Słowa kluczowe: *globalne zmiany klimatyczne, emisja gazów cieplarnianych, polityka energetyczna, bezpieczeństwo energetyczne Polski, ustawodawstwo proekologiczne*

Introduction

A dynamic civilization development, initiated by the industrial revolution in the 19th century, has been based upon the fossil fuels, used in manufacturing processes and in energy production. Utilization of fossil energetic raw materials in a wide scale has brought about the emission of enormous quantities of gases and dusts to the earth atmosphere. The contamination of atmosphere caused the changes in the climate of the earth which are observed in a form of the increase of the incidences of sudden atmospheric phenomena and rise in the mean temperature. The international communities, as being worried about the development of unfavourable phenomena related with the climate of the Globe, have undertaken the measures aiming at stopping of the unfavourable trend of warming up the climate. The mentioned measures are directed to the reduction of gases' emission by affecting the economic policy of the countries and promotion of „clean technologies" in the industrial production and obtaining the electric energy.

The elements of energy policy of Poland which counteract the global climate changes and mitigate the consequences of the mentioned changes, result directly from the Constitution of Poland and legal standard of the communities, which Poland belongs to: international – the United Nations (ONZ) and the regional one - the European Union (EU). The implementation of the adopted therein commitments is the main driver of climate regulations in the national legislation.

In the Constitution of the Republic of Poland, the texts connected with the environment protection are found in Articles: 5, 31, 68, 74 and 86. It is worth to cite here the fragments of art.5: „*.... The Republic of Poland... as being guided by the principle of sustainable development ensures the environment protection...*" and of art.74: „*.... Public authorities run the policy, which ensures the ecological safety for the contemporary and future generations...*" [1]. The mentioned provisions guarantee the active participation of the Polish Government in development of legal standards aiming at natural environment protection to all citizens of Poland living at its territory, and observing them by all citizens and enterprises, operating at its territory.

The membership of Poland in the United Nations (Polish: ONZ) has also affected the necessity of adapting Polish legislation to the regulations and recommendations, signed by the international community. During the Conferences of the United Nations on the Environment and Development, being also called the Earth Summit and held in 1992 in Rio de Janeiro, the United Nations Framework Convention on Climate Change (UNFCCC) was signed. The Conferences of the Parties (COP) is the highest organ of the Convention [22]. Its meetings are periodically organized every year. During the Conference duration, the provisions and recommendations, aiming at the climate protection, are established. The Conferences of the Parties during which the binding commitments were adopted include: 1997 COP-3 Kyoto (the Kyoto Protocol), 2012 COP-18 in Doha (the Doha Amendment) and 2015 COP-21 Paris (the Paris Agreement).

The Kyoto Protocol [23] was the main UNFCCC instrument in the struggle with the global warming and it contained the targets, binding the Parties of the Convention until 2012. The main assumption of the Protocol was the reduction of therein mentioned greenhouse gases' emission at least by 5%. The additional obligations, affecting the emission of GHG which were found in the Kyoto Protocol were as follows:

- Increase in the energetic effectiveness,
- Development of renewable energy sources,
- Development of technologies, the task of which is to absorb carbon dioxide,
- Limitation and reduction of the level of greenhouse gases' emission in transport sector,
- Limitation or reduction of methane emission in the sectors of waste management, manufacturing processes and transfer and distribution of energy,
- Activities, aiming at the reduction of the emissions generated by forestry management sector, and from agriculture,
- Running the scientific studies with the target to shape the awareness of the society and information on the varying climate,
- Encouraging to activity and introducing the reforms and measures, aiming at the promotion of the emission reductions.

During the Summit which was held in Doha 2012 COP-18, the amendment to the Kyoto Protocol was adopted, being also called Doha Amendment [24]. The mentioned amendment established the second reference period for the countries – signatories of the agreement and it covered the period of the years 2013 – 2020 and obliged its members to reduce the emissions by at least 18% up to 2020.

The recent Agreement was developed on December 12, 2015, during COP-21 in Paris; it was the Paris Agreement [25] and established the principles of the climate protection from 2020. The main assumption of the Paris Agreement was to determine the measures, leading to the reduction of global warming to the level below 2°C and striving at the limitation of the temperature rise to 1.5°C.

Poland was the associated member of the European Union since 1994 and on the 1st of May, 2004 it became the full-right member of the European Union. The membership in the EU meant, simultaneously, the adoption of all recommendations, developed for the Member States and the adaptation of the energy policy as well as that one connected with the environment protection to the respective requirements. The European Union is a leader in the international environment in the respect of reaching the climate targets and sets up the more ambitious tasks than the international community, associated in the Organization of the United Nations. The EU perspective for 2012 – 2020 (with the consideration of Doha Amendment) established the target in a form of climate package „3 X 20" (reduction by 20% of GHG emission, increase of energy effectiveness by 20% and reaching 20% of the energy share from the renewable sources, and 10-% participation of bio-fuels).

After the Paris Agreement, The European Union has also submitted the collection of documents „Clean Energy for all Europeans", being called also the Winter Package. Its purpose was to determine the energy and climate policy of the EU, in the perspective 2030, in respect of renewable energy sources, energy effectiveness, emission of greenhouse gases and electric energy inter-system connections. The established targets to be reached include: at least 32-% participation of the energy from the renewable sources in energy balance of the EU; improvement of energy effectiveness by at least 32.5 %, reduction in GHG emission by at least 50% in the total EU economy (compared to the level of 1990) and creation of electric energy inter-system connections, integrating the EU energy market with the capacity of at least 15% of peak power.

Apart from the earlier indicated articles of the Constitution, international agreements and the European Union legislation relating to the environment and climate protection in legal regulations of the republic of Poland, we may distinguish the key problems relating to the energy policy and environmental protection:

- Act of April, 10, 1997 (Energy Law [3]),
- Act of July, 17, 2009 on the management of emissions of greenhouse gases and other substances,
- Act of 28, April, 2011 on the greenhouse gases emissions trading system [5],
- Act of April, 15, 2011 on energy effectiveness [6],
- Act of April, 27, 2001 the Law of environmental protection [7],
- Act of 20, February, 2015 on the renewable energy sources [8],
- Act of December, 8, 2017 on power supply market [9].

The following governmental institutions deal with the problems connected with the energy and environment protection within the frames of the Government's activity: the Ministry of the Environment, the Ministry of Energy, Office for Energy Regulation (URE), Agency of Energy Market (ARE), National Centre of the Studies and Management of Emissions (KOBIZE) and the Centre of Information on Energy Market (CIRE).

The mentioned above institutions have developed the following documents:

- National Action Plan 2010 [10],
- Poland's Energy Policy up to 2030 [11],
- Energy Policy of Poland in 2040 – PEP 2040 [12],
- National Action Plan in favour of energy and climate [13].

The mentioned above documents determine the directions of activities of Polish Government in order to ensure the energy security to Poland and to protect the environment.

Legislative solutions in Poland

The Republic of Poland, as being the member of the UN did not have any problems with fulfilling the provisions of the Kyoto Protocol because its obligation of reducing in accordance to the Protocol was equal to 6% and the adoption of 1988 as the basic year was exceptionally favourable for Poland. CO_2 emission from the energy sector in the period of 1988 – 2012 was decreased in Poland by 27% due to the economic collapse, connected with the systemic transformation of the state (Fig.1) [2]. The economic transformations have led to the reorganization of agriculture, decline of many state enterprises, transformation of a part of industry sector via privatization and change of the production profile.

Supposedly, such easy fulfilment of the obligations connected with the emission reduction, practically without the efforts and changes in economic policy, has not been quite favourable for Poland. It made only the successive ruling elites to become convinced that the climate targets may be reached without the engagement (creation of coherent and long-term plans of the economy development and coherent legislation) and, additionally, that financial advantages may be gained when trading the allowances for CO_2 emissions. After consideration of the emission reduction, being required by the Kyoto Protocol, Poland received the emission allowances for the whole period of the Protocol's functioning, also based upon the so favourable basis of 1988. Since 2014, we have observed, however, a constant rise of CO_2 emission (cause by economic development and the increase of demand on electric energy) what is a worrying phenomenon in the context of satisfying the requirement of the Amendment to the Kyoto Protocol, being also called the Doha amendment. The emission of GHG, as equivalent of CO_2 emission, according to the sectors of economy in relation to the basic year is presented in Fig.2.

The European Union, including also Poland, has adopted the mechanism of trading of the emissions, as specified in the Kyoto Protocol (Emission Trading System, EU ETS) and is systematically improving it. At present, in the third stage (2013 – 2020) instead of national limits, the consolidated limit for the whole EU is employed; it covers more sectors of economy (45% are covered from by the EST mechanism) and the greater amount of greenhouse gases.

The basic method of giving the emission allowances consists in their sale; those being allocated on a free basis are covered with the harmonized principles. Every year, the allocated limits are lower [15]. The EU ETS Directive provides that a half of the means obtained from the trading of the emission allowances (Emission Allowances – EUA) – 1 tonne of CO_2) is supposed to be located in the non-emission undertakings or emission-reducing (limiting) ones. In return for derogation allowances which are – in Poland – freely transferred to carbon-dependent energy sector, the energy-producing companies were supposed to invest in modernization of infrastructure and gradual independence on one energy raw material. The energy companies were supposed to promote and develop the investments connected with obtaining the energy from Renewable Energy Sources (in Polish: OZE) the settlement of the correct location of the means, coming

Fig. 1. CO_2 emission from fossil fuels in Poland in the years 1960 – 2017

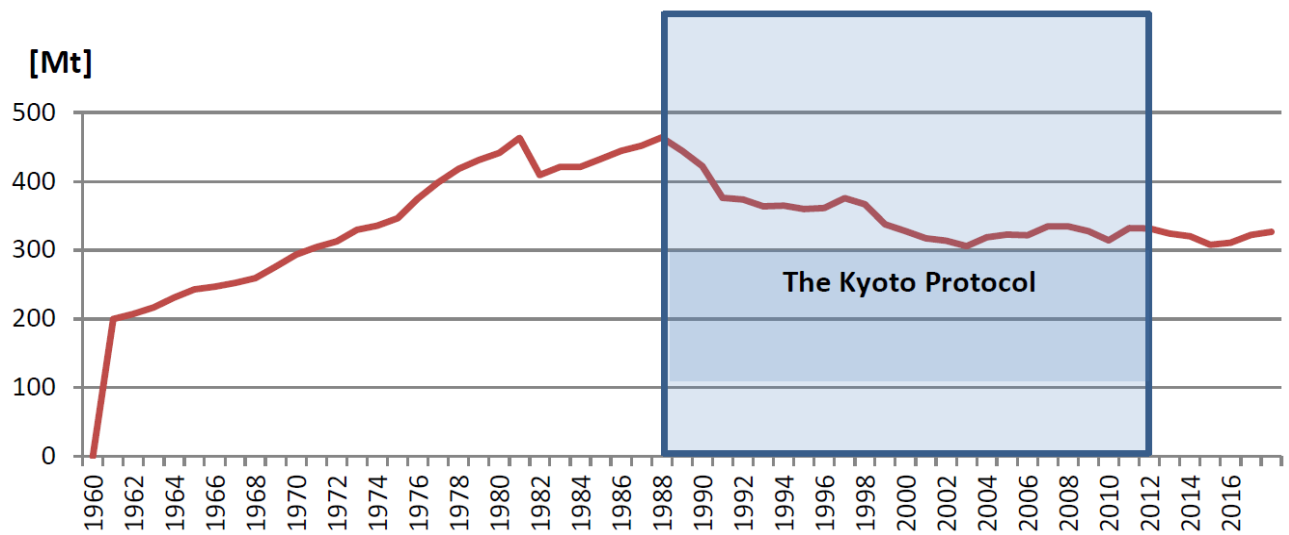
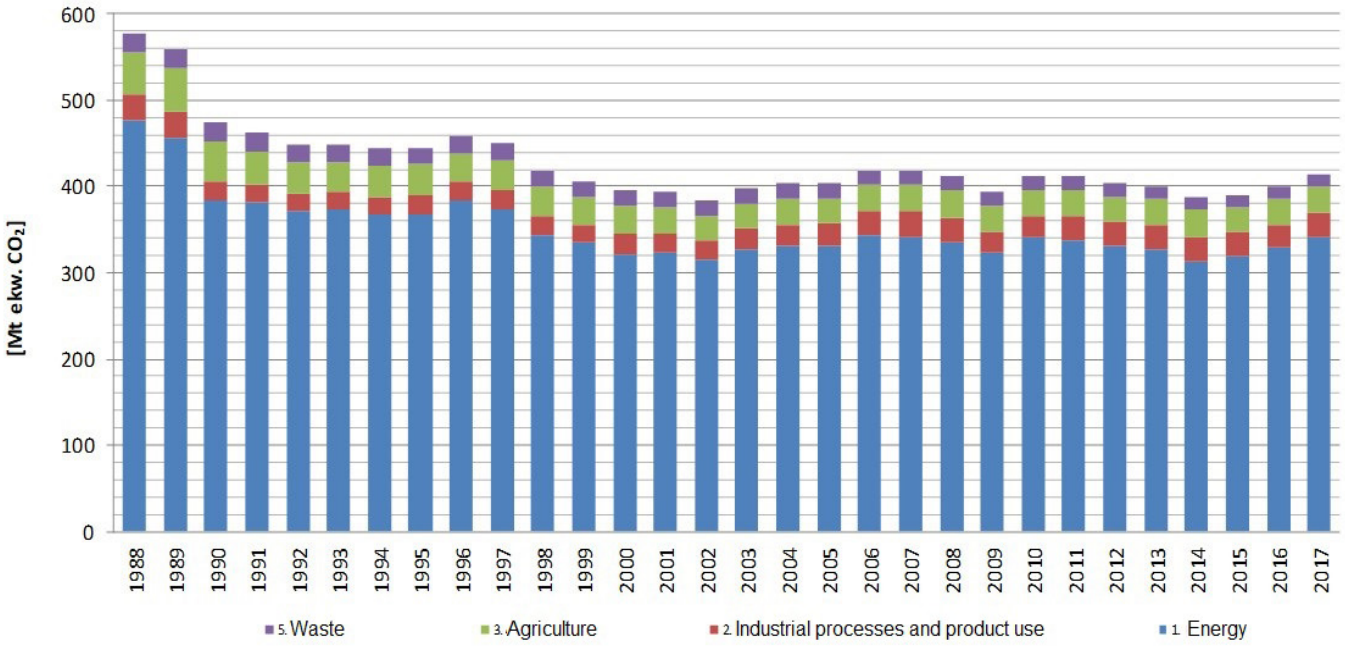


Fig. 2. CO_2 emissions (equivalent) in Poland in annual scale (blue arrow – year and basic level of the Kyoto Protocol) [14]



from trading of allowances and their level is much difficult due to a lack of transparency of the investments as well as accounting in the particular countries [16]. In Poland, a part of the means from the EUA trading, as provided in the EU ETS Directive, was directed to the problematic modernization of carbon blocs for co-incineration of biomass – what was expected to reduce the emissions from carbon. At present, Poland has 110 million of the non-utilized allowances of the derogation emissions (period of 2012 – 2020) and it notified the European Commission (June 2019) about the will to sell the mentioned allowances. At present price of the emission allowances being found on the level of 25 – 27 Euro/tonne of CO_2 [17], it gives enormous sums which could feed the climate-protecting energy undertakings.

The national target of Poland in respect of the participation of the energy from the renewable sources in a final gross energy consumption in perspective of 2020, in the „3 X 2" package has been outlines at minimum 15%. The real reaching of the mentioned target according to the State as a half of 2019 is problematic and it was confirmed by the European Court of the Auditors in its report [18]. After 2020, it may result in high costs of static transfers of „green" energy from the countries which would reach their goals in excess.

Since 2005, the system of support of the producers of „green" energy had functioned in Poland in a form of „green" certificates (different colours, according to the source and type of energy production) and the replacement payment. The discussed system was changed in 2018 by the feeds-in-tariffs (Feed in Tariff, FIT) and feed-in-premiums (Feed in Premiums, FIP). The prosumers (prosumer is a person who produces and consumes a product – translator's note) are encouraged by a specific network „storage service", offering the possibility of free-of-charge accounting of 80-% or 70-% (depending on the power of installation) excess of electric energy, being earlier introduced to the networks by their installations.

The clusters of energy are very interesting, climate-promoting solution, promoted by the Government. They were introduced by the change of the Act on OZE (renewable energy sources) and other laws [19]. Formally, the definition of the energy cluster is referred to a civil law agreement, concluded between the physical persons, legal persons, scientific entities, research institutes and, also, units of territorial self-governing organs. Its activity subject covers production and equalization of the demand, distribution and turnover of energy (including that one from the renewable sources) or the selected (by the cluster members) particular elements under the condition of activity within the distribution network (own, or of Distribution System Operator; in Polish: OSD) with a rated voltage lower than 110 kV. The area of the energy clusters should not exceed the area of 5 communes (gminas) or one poviat (administration units of lower degree in Poland). The purpose of the clusters is to develop the distributed energy in the environment-friendly way, with the utilization and satisfaction of local resources and needs, to improve the local energy security with the preservation of the economic target due to innovativeness.

We should also mention the co-incineration of biomass and coal which was, in the intention of the successive governments, the main element of reaching the climate goals. The power companies, utilizing mainly the coal as energy resource were supposed to introduce the biomass addition to be combusted in the traditional energetic boilers. The EU limitation of the support for such solution, the decrease of classifying the climate effect by coefficient 0.5 and the limitation of the biomass import, and in consequence, its high price, have caused a significant reduction in the quantity of the co-incinerated biomass. On the other hand,

it should be stressed that the quantity of the biomass, used in the installations where it is the main source of heating and electricity energy has not been changed.

One of the methods for increasing CO_2 absorption, connected with the forest biomass is the Carbon Forests Project (in Polish: LGW) belonging to the State Forests, being commenced in 2017 at the territory of 12 000 ha [20]. It consists in the increase of CO_2 absorption by the appropriate treatment procedures in the forests, including planting, introduction of forest underwood, etc. In 2018, the auction of Carbon Dioxide Units (JDW in Polish), generated in the mentioned project (30 thousand tonnes of CO_2) and bought by the state power enterprises. The mentioned undertaking should be evaluated as a pilot-research study. The measures taken within the frames of LGW are the treatment operations, necessary for forest cultivation; their general effect may be determined below 0.01% of Poland's emissions.

The Act of 8 December 2017 on the power market [9] is the important element of energy policy. Its intention is to compensate the power enterprises for the maintenance of generating power reserves which may ensure the safety of Electric Power System (in Polish: SEE) of Poland. It will be implemented via the payments, determined during power auctions. The mentioned safety could be threatened in the periods of a lack of generating factors for renewable sources which are supposed to have an increasingly greater participation in the energy mix of our country. When concluding the long-term contracts (until 2035), Poland wanted to subsidize - by power payment – the coal-based energy plants for which the European Union does not anticipate such support in the provisions of the Winter Package if the emissions of installations exceed 550 g CO_2/kWh. Finally, it was agreed upon in June 2019 that the binding period of the mentioned contracts would extinguish in July 2025. After the mentioned date, the units, the emissions of which do not exceed the standard of the Winter Package, will be able to apply for the power contracts. The recipients of electric energy will find – apart from the OZE payment and the so-called transition payment (the stranded costs) – the additional new position in a form of power payment in their bill for electricity.

Polish energy plans and environment protection

The main assumptions of the long-term energy policy of Poland for the coming years have been contained in the document „ENERGY POLICY OF POLAND UP TO 2040" (PEP 2040), developed by the Ministry of Energy in 2018. When referring to the project of the Energy Policy of Poland PEP 2040, we have to state that it is very conservative and maintains the present state of our energy, based now in 80% upon coal. The suggested solutions are promoted by big energetic companies, based on the coal energy. It is inconsistent with the guidelines, contained in the international agreements, both in the European and all-the-world scale. It will bring the problems to Poland in respect of the fulfilment of the obligations resulting from the international agreements and concerning the reduction of the greenhouse gases emissions. Keeping the high energetic dependence on the centralized energy system, dependent on one power source and maintaining the monopoly of energy-carbon based enterprises is not favourable for generation of distributed generating sources. The conservative nature of plans results from the stable and foreseeable scale of energy production in the traditional systems and easy possibility of controlling the generating process. The energy security of the country cannot be, however, based only and solely upon the fossil fuels (principally, only coal) and the plans consider the diversification of the energy sources only to an insignificant degree. The expected participation of the fossil sources was established at the level of 60% in 2030 and of the elements based upon OZE (renewable sources) only at 21% what is rather a moderate value in comparison to other EU countries. It is planned to compensate the size of demand on energy by the development and modernization of carbon-based energy plants and deciding on nuclear energy (9GW in 2043). The utilization of nuclear energy and, in fact, its creation from the very beginning in our country stays in the contradiction to the trend prevailing in the EU countries, i.e. departing from the mentioned above solution. It may be observed that the whole plan is based on maintenance of dominating primate of a large-scale energy. It should be mentioned that many countries are departing from the large-scale energy in favour of the distributed energy distributed energy based on OZE. The implementation of the mentioned plan will cause the adoption of more modernizing trend of Polish energy which would differ from the present world directions. The dates of launching the particular blocs of nuclear power plant, as provided by PEP, are problematic due to the fact that any location, financing sources or (the most important problem) the suppliers and technology have not been chosen until now. Moreover, the process of acquiring the competences by the appropriate staff is several years; it is a very significant matter as Poland does not have any competences in this field. It is also important that 80% of the costs if the discussed investment will go to the economies of other countries.

The document does not consider the necessity of counteracting and reducing the effects of the anthropogenic climate changes what remains Poland's obligation since the moment of signing the Paris Agreement. The discussed project does not clearly refer to the climate targets, adopted within the EU frames; it only states the necessity of such negotiating of the regulation provisions which would not weaken the competitiveness of the Polish economy. There is also a lack of at least mentioning the research work on the negative CO_2 emissions. All climate scenarios IPCC (Intergovernmental Panel on Climate Changes) have adopted the assumption of operating of such installations at the scale having a significant effect on climate as early as from 2030. The mentioned technologies include CDR (Carbon Direct Removal), CCS (Carbon capture and Storage), BECCS or BioCCS (Biological Energy Carbon Capture and Storage).

IN PEP 2040 project, the energy effectiveness has been situated as the eight, last item what may mean that it is not perceived as the important instrument, serving for rationalization of energy requirements. Its real importance is decidedly higher

and especially, in relation to agriculture. The agricultural sector could not only rise up the productivity but also reduce CO2 emissions coming from cultivated soil and energy consumption in manufacturing processes due to the popularization of better agricultural practices. The quality of the soils would be improved and the awareness of the farmers – in respect of modern cultivation methods – would be developed. The energy effectiveness has a great meaning in construction and industry where the greatest progress was achieved. Especially in building, it is planned to lower the energy consumption owing to the introduction of the new standards, reducing the energy consumption and promoting the low-emission and passive construction [21].

The development of OZE sources and energy storage systems, the real and expected decline of their prices has not been noticed by the authors of the discussed project. The investments in ZE are considered in the document as the necessary fulfilment of the energy – climate policy of the EU. The recognition that the resources of renewable energy have a strategic character and not the supplementary one would be crucial for the report and, in consequence, for its basic theses. A lack of confidence in OZE may be found in a fragment of PEP 2040: „... market of electric energy has been strongly deformed due to functioning of subsidized renewable energy sources (OZE) characterized by a high instability of work and priority of introducing the energy to network...". Meanwhile, in the years 1990 – 2016, the subsidies for coal mining and carbon energy amounted to 230 billion PLN; the further subsidizing will mean a sum of equal to 155 billion PLN in the years 2017 – 2030 (excluding the external costs); the subsidies for closing of manufacturing plants as adopted by the European Commission constitute only few percent of the mentioned sum [22]. On the other hand, the support for OZE in the years 2005 – 2016 amounted only to 33.6 billion PLN, 50% of which were destined for co-incineration in the state energy enterprises.

Summing up

Poland, with its structure of energy production, based mainly on carbon, in the perspective of the coming years and the restrictions, connected with the climate protection may have the problems with the fulfilment of the obligations, resulting from legal standards, imposed by such institutions as the EU and Organization of the United Nations. Lack of coherent, multiannual vision of the energy development and the multi-annual neglecting, connected with the development of energy systems and technologies of the energy generation put the difficult tasks before the Polish government. The indecisive policy concerning the diversification of the energy resources, chaotic legislative measures of the successive governments, uncertainty of the law's stability (dynamic changes in the existing legal standards), undecided policy of moving the energy to the renewable sources, slow distribution of the sites of the energy generation make that Poland is not perceived as a leader of the energy transformations with a low and, ultimately, negative CO2 emission.

The initiative, inspired by the Government of Poland and implemented by the State Forests (State Forests National Holding), being aimed at increase of CO_2 absorption in the forests in spite of its microscopic scale, is consistent with the guidelines of the Kyoto Protocol. We should also mention the announcement of the Minister of Energy informing about establishment of Modernization Fund which would receive the means from the sales of 110 million allowances for the emission in this year; they would be used in modernization of our energetic system.

In conclusion, when considering the current measures, undertaken by the Government of Poland, and the plans for the future, concerning the energy policy, we should state that the fulfilment of the obligations, resulting from the membership in the EU and UN requires as follows:

- Stabilization of the energy and legislative policy for many years, being independent on the changes in the political sphere (lack of the populist activities of the successive governments),
- The successive replacement of traditional, based on the fossil fuels – carbon, by the pro-ecological solutions based on OZE (Renewable Energy Sources),
- Giving the long-term priority to the environment-friendly solutions in the energy production,
- Intensive raising public awareness via indication of environmental and climatic threats, the sources of their generation and the resulting consequences,
- Running the intensive studies concerning ensuring the energetic security with the utilization of OZE sources,
- Propagation of activities supporting the counteracting the climatic changes, commencing from the waste sorting, style of life, etc.,
- Reliable information of the costs as well as possible social and material advantages of the energetic transformations, with the aim to achieve the social consensus in this matter,
- Good orientation towards and harmonization of the changes in the structure and distribution of production as well as consumption of energy in ETS and non-ETS sectors,
- Running the research and implementation work on the negative CO_2 emissions.

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