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Significance Of The Climate And Energy Package For The Development Of Renewable Energy Sources In The European Union

Abstract

The utilisation of renewable energy in the European Union seems, at the present stage of energy policy development, inevitable. It offers many benefits, including, above all:

- *the possibility of increasing the energy security of a given state or region thanks to the diversification of the sources of energy supply,*
- *the limitation of imports from energy suppliers, such as of natural gas or oil, thus reducing dependence on imported fossil fuels,*
- *ecological effects connected with the elimination of greenhouse gas emissions and other substances harmful to the natural environment,*
- *economic and social benefits, such as the creation of new jobs.*

The Climate and Energy Package obliges member states to pursue a common aim – to increase the share of renewable energy to 20% in the general energy balance of the European Union by 2020. This is a challenging task, since the renewable energy sector requires significant financial support to increase its competitiveness, compared to traditional energy sources. When adopting the Energy Package, leaders of member states did not anticipate the economic crisis and its impact on the European Union's economy, and on the energy sector in particular.

Keywords: *climate and energy package, renewable energy sources, European Union policy, energy security, energy mix, instruments for supporting development of RES*

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1. Introduction

Development of the renewable energy supplies worldwide seems inevitable due to limited natural fossil fuel resources and the need to increase the security of the energy supply of individual countries. Moreover, a fundamental advantage of renewable energy sources is the fact that, apart from the energy production effect itself, they offer a positive environmental effect, including the reduction of conventional fuel consumption and curbing harmful emissions of CO₂.

By promoting the development of renewable energy supplies, the European Union hopes to reduce reliance on imports of fossil fuels from outside the EU and create new jobs associated with this sector, hence in recent years it has directed its energy policy towards supporting the development of renewable energy supplies. The path it has chosen to achieve this goal is the realisation of the energy and climate package, also named the “3x20% Package”. It provides for increasing the share of renewable energy up to 20% of the overall energy consumption in the European Union by 2020. This goal will be very difficult to achieve, since investments in renewable energy sources - being very specific expenditures in tangible goods - require huge outlays, often at the cost of other sectors and branches. Moreover, these investments are of a long-term nature, requiring adequate legislation to ensure they provide an appropriate return rate for investors.

The purpose of this paper is to:

- define the factors determining the share of the renewable energy supply sources in the energy consumption balance of the European Union,
- explain the idea underlying the Climate and Energy Package and determine the status of fulfilment of the provisions relating to the sources of renewable energy,
- review the prospects for the development of sources of renewable energy in the EU by 2020.

2. The Idea of Renewable Energy Sources, and Their Share in the Energy Consumption Balance of the European Union

A simple classification divides sources of energy into renewable and non-renewable. Non-renewable sources include fossil mineral fuels such as hard coal, lignite, crude oil or natural gas. These sources are finite and their quantity

is limited. The rate of their extraction has been rapidly increasing in the last century and is still very high; the world's supply of these resources has become severely depleted.

On the other hand, renewable sources are characterised by a specific feature – their exploitation in a given place does not deplete the general resource: solar radiation, wind, rivers, sea currents and tides, and biomass (Ligus 2010).

In the report of 1972 published by the Club of Rome (*The Limits to Growth* Meadows, Meadows, Randers, Behrens, 1972) a pessimistic scenario for the world was presented, predicting that natural resources would be exhausted (by 1990 the entire supply of oil and gas resources was predicted to be depleted) and, due to their insufficient quantity, interruptions in their supply were to inevitably occur. While these predictions have not materialised, nevertheless today some people still think that the world's production of crude oil has reached its maximum, so-called "peak oil", which means that further deposits will be more difficult to find and extract. Others point out that new discoveries of oil in Brazil and shale gas in the USA, as well as deposits of alternative minerals, recede the spectre of collapse of the fuel supply, and contradict the theory of exhaustion of resources. The discourse has stimulated the search for fuel substitutes and the development of new technologies – including renewable sources of energy.

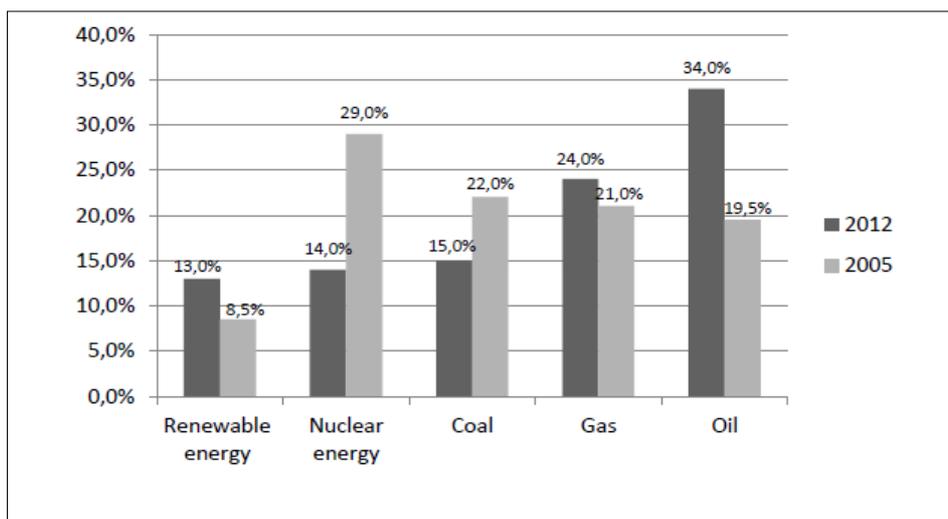
In connection with the limited character of resources as well as events such as oil shocks, gas crises, and spikes in fuel prices, the European Union has strongly engaged in the development of renewable sources of energy. It became one of the priorities of European energy policy, interlinked with its three principal goals:

1. Energy security of EU countries
2. Competitiveness of the EU economy
3. Protection of the natural environment against the harmful effects of energy production, supply and consumption.

Moreover, the utilisation of local, renewable sources of energy facilitates the diversification of energy supply, which is deemed to be very important in the context of the EU's strong dependence on fossil fuel imports. Apart from increasing the level of self-dependence in terms of energy, the use of renewable energy sources also offers environmental advantages. The main attractive feature of renewable sources of energy is their substitution of high-emission fossil fuels. They thus play a key role in the realisation of the EU's idea of decarbonisation of the economy and its climate policy. The European Union also counts on social effects stemming from the utilisation of renewable energy sources, such as the creation of additional employment opportunities and the economic stimulation of regions.

In 2012, the total energy needs of the EU, in terms of its gross consumption of energy, consisted of 34% oil, 24% natural gas, 15% fossil fuels (coal), 14% nuclear energy, and 13% by energy from renewable sources (hydropower and wind energy) (*Energy challenges and policy, Commission contribution to the European Council, Fig. 1*).

Figure 1. Energy balance of European Union in 2005 and in 2012

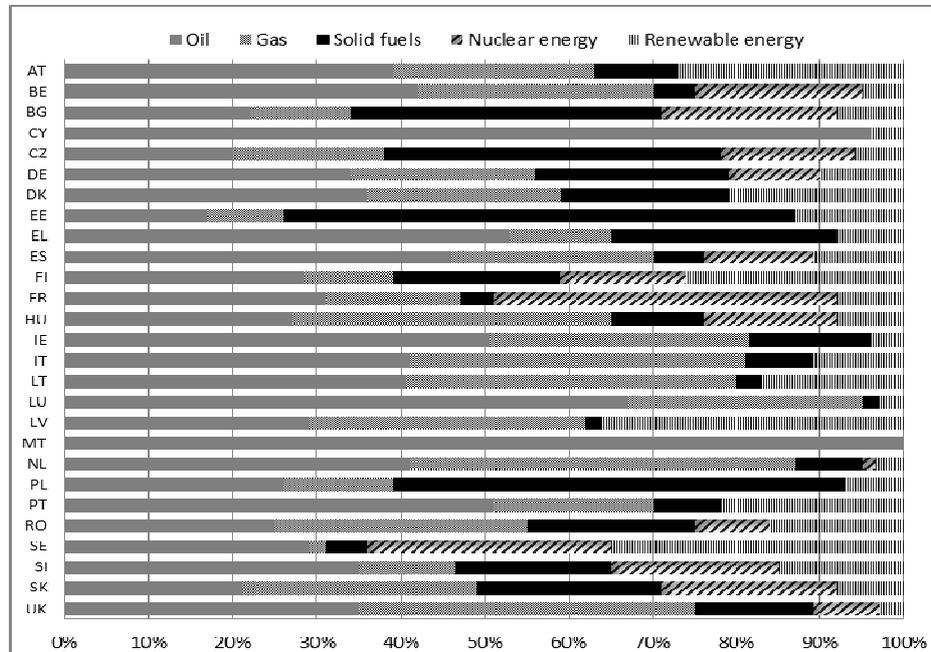


Source: own materials based on: *Energy challenges and policy, Commission contribution to the European Council and Energy, transport and environment indicators, 2007 edition, Eurostat& European Commission, Luxembourg: Office for Official Publications of the European Communities, 2007.*

The share of energy obtained from renewable sources is highly diversified across European countries (Fig. 2). It differs significantly and evolves due to geographical conditions such as the presence of mineral deposits and their accessibility, policies adopted by individual countries (including financial incentives), technological progress, decarbonisation requirements, and development of the home market.

The following countries have the largest share of energy obtained from renewable sources in their energy mix: Sweden, Latvia, Finland, Austria and Denmark.

The share of energy obtained from renewable sources in the EU's overall energy balance has been systematically growing. This is primarily due to ecological debates, energy safety considerations, and the Climate and Energy Package adopted in 2008.

Figure 2. Energy mix in European countries in 2012

Source: Energy challenges and policy. Commission contribution to the European Council of 22 May 2013.

3. The Climate and Energy and Energy Package Gives the Green Light to the Development of Renewable Energy Sources

The Climate and Energy Package adopted in March 2008 presents the assumptions of the European Union's energy policy, the so-called "3x20%" goal, which has to be fulfilled by member countries by 2020 and includes:

1. An increase of the share of energy obtained from renewable sources to 20% of the general energy balance of the EU;
2. The reduction of CO₂ by 20%, when compared with emissions from 1990;
3. The reduction of the overall consumption of energy coming from primary sources in the European Union by 20% against the basic prediction for 2020, presented in 2007.

Additionally, it was agreed that the share of biomass in the total fuel consumption of transportation across the EU will increase to 10% (*Green Paper. A 2030 framework for climate and energy policies*).

The above-mentioned paper is a regional initiative aimed at finding fast and effective ways to stop climate change. It should also help break the connection between economic development and the degradation of the natural environment. The package is intended to be the basis for the introduction of radical changes in the functioning of the energy sector across the EU, since it is the energy sector, far more than transport and industry, that is responsible for high emissions. (See: *Energy, transport and environment indicators - 2013 edition*, Luxembourg: Publications Office of the European Union, 2013).

The package includes four directives concerning: promotion of the use of energy from renewable sources, reduction of greenhouse gas emissions, broadening and strengthening of the Union's system of emissions trading, and geological storage of carbon dioxide. Moreover, two general communications were issued on supporting early stage demonstrative actions in the area of balanced energy production from fossil fuels, and general guidelines up until 2020 (Table 1).

Table 1. Documents constituting the Climate and Energy Package

Title and type of document	No acc. to EUR – Lex
Communication of the Commission to the European Parliament, the Council and the European Economic and Social Committee, and the Committee of the Regions <i>Supporting undertaking, at an early stage, demonstrative actions related to balanced production of fossil fuel energy</i>	COM (2008) 13
Motion of the Commission <i>Directive of the European Parliament and the Council revising the directives 2003/87/EC in order to broaden and strengthen the Union's system of emissions trading</i>	COM (2008)16
Motion of the Commission <i>Decision of the European Parliament and the Council setting differentiated limits on greenhouse gas emissions (GHG) for each Member State aimed at reduction of emissions of greenhouse gases in order to fulfil the obligations of reduction of emissions of greenhouse gases by 2020</i>	COM (2008)17
Motion of the Commission <i>Directive of the European Parliament, the Council on the Geological Storage of Carbon Dioxide revising the directives of the Council 85/337/EEC, 96/61/EC, directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC and regulation EC no1013/2006</i>	COM (2008) 18
Motion of the Commission <i>Directive of the European Parliament and the Council on the promotion of the use of energy from the renewable sources</i>	COM (2008) 19
Communication of the Commission to the European Parliament, the Council and the European Economic and Social Committee, and the Committee of the Regions <i>20 and 20 by 2020 Europe's opportunity to combat climate change</i>	COM (2008) 30

Source: L. Szczygieł, *Meandry europejskiej polityki...*, op. cit.

The Renewable Energy Sources Directive (RES) (“Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources”, Brussels, COM (2008)) obliges member states to achieve the goal of a 20% share of energy from renewable sources in the EU’s overall energy balance by 2020. (*National Overall Share and Targets for the Share of Energy from Renewable Sources in Gross Final Consumption of Energy in 2020*).

The Directive established the general limit for specific states of their target share of energy from renewable sources (see Table 2), and the precise method of calculating it, assuming as a benchmark the share of energy from renewable sources in 2005.

Table 2. National share of energy from renewable sources in total energy consumption in 2005 and 2020

EU-27 countries	Share of energy from renewable sources in total energy consumption in 2005 (%)	Target share of energy from renewable sources in total energy consumption in 2020 (%)
Austria	23.3	34
Belgium	2.2	13
Bulgaria	9.4	16
Cyprus	2.9	13
Czech Republic	6.1	13
Denmark	17.0	30
Estonia	18.0	25
Finland	28.5	38
France	10.3	23
Germany	5.8	18
Great Britain	1.3	15
Greece	6.9	18
Holland	2.4	14
Hungary	4.3	13
Ireland	3.1	16
Italy	5.2	17
Latvia	32.6	40
Lithuania	32.6	40
Luxemburg	0.9	11
Malta	0.0	10
Poland	7.2	15
Portugal	20.5	31
Romania	17.8	24
Slovakia	6.7	14
Slovenia	16.0	25
Spain	8.7	20
Sweden	39.8	49

Source: own materials based on: National Overall Share..., op. cit.

With respect to the decisions concerning the use of energy from renewable sources in individual countries of the EU, a compromise has been reached and it was agreed that the target will not be identical for all member countries. For instance Denmark, whose total share of energy from renewable sources in 2005 amounted to 17% was targeted to achieve 30% in 2020, while Poland which used 7.2% of renewable energy in its total consumption of 2005 needs to reach 15% in 2020 (Pach-Gurgul 2012).

Increasing of the share of energy from renewable sources in the structure of production and consumption of power in the EU is a difficult and very expensive task. It requires implementation of solutions supporting the growth of this share and at the same time leading to lowering the costs of production of renewable energy, consequently improving its competitiveness.

The necessity to support renewable energy sources stems first of all from the much higher cost of production of renewable energy compared to energy based on conventional sources. The reason for this is the high capital expenditures that accompany launching renewable installations and connecting them to the network. Another important consideration is the discontinuous character of renewable sources – implying the need to supplement them by conventional sources of energy, together with the accompanying costs of balancing power supply systems, as well as incomplete legislative measures, which can raise concerns in investors.

There are several ways to support the development by EU countries of production of energy from renewable sources (Table 3).

A popular form of support for the development of renewable energy is the mechanism of feed-in tariffs (FiTs). In the case when these tariffs have a long-term character, they allow the investors to evaluate the efficiency of the investment (including its payback period) in a more effective way, thereby encouraging them to invest in such energy sources. In connection with the Quota Obligations (QOs) of the distribution companies, these tariffs constitute a significant factor for co-financing projects in renewable energy (Motowidlak 2012).

Another instrument for supporting renewable sources of energy are tax incentives. Such a form of support for EU member states is guaranteed by the provisions of the 2003/96/EU Directive. These perks may take the form of incentives for investments in the renewable energy sector (the supply of pro-investment instruments) to initiate their utilisation (post-productive supply instruments).

Subsidies and all types of grants constitute a non-refundable form of financial support of projects in renewable energy. They are not of a market type and are usually applied at the early stages of renewable energy development.

Table 3. Instruments for supporting development of renewable energy sources

FINANCING	ADMINISTRATIVE	NETWORK
Systems supporting the purchase of renewable energy sources: - fixed purchase price (guaranteed price), - green certificates, - tenders.	Quantitative obligation to buy energy from renewable sources	Determining justified costs of using distribution networks
Donations and subsidies	Obligation to give priority to the transfer of power from renewable sources in the national energy system	Transparent prices of access to the network
Preferential and low-interest credit	Issuing certificates of origin of renewable energy, together with the accompanying proprietary rights	Subsidies for necessary modernisation of networks
Fiscal support: - tax allowances, - exemptions from excise duty, - lower VAT rates.		Co-financing the connection to the network

Source: own materials based on J. Pyka (ed), *Szansa i zagrożenia rozwoju rynku energetycznego w Europie i Polsce*, Wydawnictwo Akademii Ekonomicznej w Katowicach, Katowice 2007.

In order to meet requirements concerning renewable energy, EU member states have worked out and implemented their own national programmes for supporting and promoting the creation of renewable energy. These programmes reflect the diversity of available systems of support and the varied financial possibilities of EU member states. It must be stressed that financing the above programmes is a burden for the budgets of member states, and this fact, especially during the economic crisis, has put a question mark over the future development of renewable sources of energy.

4. The Degree of Implementation of the Provisions of the Climate and Energy Package Concerning the Development of Renewable Sources of Energy in EU Member States

The economic crisis, which especially hit the countries of the Euro zone, has also affected the realisation of the provisions of the Climate and Energy Package, including those pertaining to renewable sources of energy.

In 2010, the majority of EU member states managed to cope quite well with increasing the usage of renewable sources of energy in their energy

balance, including for example: Austria, Bulgaria, Germany, Denmark, Estonia, Lithuania, Romania, Sweden and Slovenia. It is also worth emphasising that Spain and Italy – countries undergoing significant economic problems during the economic crisis – had earlier belonged to the group that were dynamically developing renewable sources of energy (cf. Table 4.).

Table 4. The progress in the implementation of the Directive on Renewable Sources of Energy¹

Member state	The share of renewable sources of energy in 2005	The share of renewable sources of energy in 2005	Intermediate objective	The objective concerning renewable sources of energy
Austria	23.3%	30.1%	25.4%	34.0%
Belgium	2.2%	5.4%	4.4%	13.0%
Bulgaria	9.4%	13.8%	10.7%	16.0%
Cyprus	2.9%	5.7%	4.9%	13.0%
Czech Republic	6.1%	9.4%	7.5%	13.0%
Denmark	17.0%	22.2%	19.6%	30.0%
Estonia	18.0%	24.3%	19.4%	25.0%
Finland	28.5%	33.0%	30.4%	38.0%
France	10.3%	13.5%	12.8%	23.0%
Germany	5.8%	11.0%	8.2%	18.0%
Great Britain	1.3%	5.0%	4.0%	15.0%
Greece	6.9%	9.7%	9.1%	18.0%
Hungary	4.3%	8.8%	6.0%	13.0%
Ireland	3.1%	5.8%	5.7%	16.0%
Italy	5.2%	10.4%	7.6%	17.0%
Latvia	32.6%	32.6%	34.0%	40.0%
Lithuania	15.0%	19.7%	16.6%	23.0%
Luxemburg	0.9%	3.0%	2.9%	11.0%
Malta	0.0%	0.4%	2.0%	10.0%
The Netherlands	2.4%	3.8%	4.7%	14.0%
Poland	7.2%	9.5%	8.8%	15.0%
Portugal	20.5%	24.6%	22.6%	31.0%
Romania	17.8%	23.6%	19.0%	24.0%
Slovakia	6.7%	9.8%	8.2%	14.0%
Slovenia	16.0%	19.9%	17.8%	25.0%

¹ Directive 2009/28/EC of 23rd April 2009.

Spain	8.7%	13.8%	10.9%	20.0%
Sweden	39.8%	49.1%	41.6%	49.0%
EU	8.5%	12.7%	10.7%	20.0%

*The most objective measure of progress is the evaluation of member states in comparison with their first intermediate objective, calculated as the mean of the shares in 2011-2012.

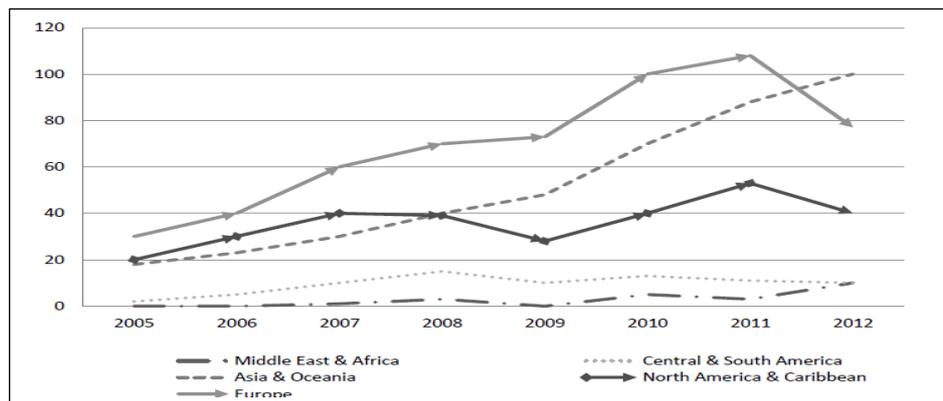
Source: own work on the basis of *Energy Challenges and Policy*, EC contribution to the European Council of 22nd May 2013.

In spite of the crisis, the share of energy from renewable sources in the entire EU in 2012 amounted to 13.0%, in comparison to 8.5% in 2005 (*Energy Challenges and Policy*, 2013). According to the most recent data from 2012, the first country which exceeded the objective for 2020 was Estonia, which achieved an almost 26% share of renewable energy in its energy balance, with its objective for 2020 being 25%.

The lowest share of “green” energy in the EU was in Malta (0.4 %, with the objective being 10%) and in Luxembourg (2.9%, with the objective being 11%) (*EU Energy, transport and environment indicators*, 2013).

It should be stressed here that by mid-2011, the EU was the world leader in the development of renewable sources of energy and had devoted great financial resources to this objective – much larger than those designated for the same objective in China or the USA (cf. Fig. 3). The intensification of the effects of the crisis within the Euro zone led however to a decrease of investments into renewable sources of energy in specific EU member states. Also, there was a reduction in the supply of resources to framework funds and programmes created at the EU level for the purpose of supporting its renewable energy sector.

Figure 3. Investments in renewable sources of energy in 2005-2012 (in USD billions) in specific world regions



Source: own materials based on: *Energy Challenges and Policy*, EC contribution to the European Council of 22nd May 2013.

Increasing unemployment and the indebtedness of countries during the crisis re-ignited the discussion whether given EU member states could afford the development of renewable energy sources, and inasmuch as this is an expensive source of energy the point of subsidising it was questioned. Subsidies which in recent years supported prosperity in this field are, in times of crisis and looming cutbacks, unfortunately treated as a burden to the budget and to the final recipients of the energy. The real costs of renewable energy are turning out to be too high for many European economies. Experts are certain that a mechanism of subsidising should exist in some form or other, as the production of solar and wind energy is very expensive. However, the current permissive legislation concerning the determination of forms and conditions of subsidies within the EU does not work.

In order to combat the effects of the economic crisis, the EU member states decided to introduce cutbacks, thereby limiting their support for the renewable energy sector. In the face of growing unemployment rates and increasing debt, the financing and subsidising of the renewable energy sector was reduced. At the same time, sudden changes in the systems of support were introduced, in some cases having a retroactive effect, thus leading to investor uncertainty and limiting investments in such sources of energy. Entrepreneurs were hampered in their investments.

The limitations on subsidising the renewable energy sector, having the consequence of leading to a slow-down in the development of renewable energy sources, were heaviest in Spain, Germany and the Czech Republic, but also in Italy, Bulgaria and Great Britain.

Spain was the first EU country to admit that it could not afford further support of new investments into renewable sources of energy at the required level of subsidising. This country – a world and European leader in the use of renewable energy in 2001 – had a share of energy coming from renewable sources exceeding 30%. Subsidising wind farms and photovoltaic cells was supposed to make renewable energy a new source of economic growth that would hasten the creation of new jobs (*Hiszpania nie będzie liderem w wiatrowniach*, [Spain will not be the leader in wind farms], 2012). However, the economic crisis changed economic priorities, the result of which was that investments into renewable sources of energy were almost completely stopped in 2013.

Italy has been coping with problems similar to Spain's. In Italy, the system of governmental support for renewable energy is currently being reformed, as existing regulations are becoming too expensive. **The system for subsidising existing renewable energy has led to the situation whereby the supply of energy coming from renewable sources exceeds the demand.** Italy is now another country which has decided to reform its system of subsidising

renewable energy (*System wsparcia dla energetyki odnawialnej we Włoszech potrzebuje zmian, [The system of subsidising renewable energy in Italy needs change. 2011).*

Also in the Czech Republic the economic crisis has resulted in a problem with subsidising renewable sources of energy. The FiT system for solar energy in the Czech Republic was commenced in 2006, as a result of the fact that the Act on promoting renewable sources of energy obligated the sellers to purchase energy from solar plants at a price several times higher than the market price. Additionally, energy producers received exemptions from income tax for a period of five years from the moment they became connected to the network. In the system of subventions, the corrective mechanism was envisaged to consist of a decrease of subventions by 5.0 % annually (*Status of Photovoltaics in the European Union New Member States, 2011*). It was assumed then that with the development of photovoltaic cells, the cost of energy production would gradually decrease. However, the prices of photovoltaic cells were dropping much faster than had been predicted. In such circumstances, subsidies which were meant to guarantee a return on investments within eleven years allowed investors to gain this return within only four. Starting the FiT system resulted in the sudden growth in the number and power of photovoltaic cells in the Czech Republic. There was a sharp increase in the number of solar energy plants, from fewer than 1500 in 2006 to almost 13,000 in 2010. During the economic crisis, this sudden increase of power generated by the installations containing photovoltaic cells became a burden for the Czech economy. The guaranteed sale price for solar energy, as well as EU and state subsidies, resulted in public pressure to increase electrical energy prices. The increase in electrical energy led to an increase in prices of consumer goods, which was highly inconvenient in the time of crisis. Therefore, in November 2010 the law on supporting renewable energy was changed in the Czech Republic. The provisions limited subsidies only to solar cells in the roofs or walls of buildings, and withdrew these subsidies from installations not connected to the network (*Solar subsidies cut by more than half 2011*). The five-year period of “tax freedom” for producers of renewable energy was abolished.

In the case of Germany, the basic motive for the limitation of subsidies for photovoltaic cells was the effect of these subsidies (similar to the Czech Republic) on the price increases in electrical energy and, therefore, on the prices of consumer goods across many branches of industry (Motowidlak 2012). The increases in these prices also affected many households.

5. Conclusions

The Climate and Energy Package raises many controversies and disputes. The reservations are voiced, first of all, by the countries in which the production of energy and heat is based, to a large degree, on high-emission hard coal and lignite (e.g. in Poland, where more than 90% of electrical energy is produced from hard coal and lignite). Such fears are also raised by the EU countries in which GDP, measured per capita, is low (mainly the new EU-12 member states), and whose further economic development is strictly connected with an increase in the demand for energy. Also the countries in which the energy-consuming industry is highly developed point out the risk of becoming uncompetitive, which might lead to a shift of the production of, e.g., cement and many other energy-consuming and heavy-industry products to the countries with less strict policies concerning the emission of greenhouse gases (*carbon leakage*). These doubts were intensified by the economic crisis of 2008, and in particular the crisis of the Euro zone. Large state debts, immense unemployment and the difficulties in the banking sector raised the question whether reaching the targeted 20% share of renewable sources of energy in the overall energy balance of the EU should still be a priority, given such grave economic problems.

In spite of difficult economic situation in the European Union, creating many financial, administrative or infrastructural and location obstacles for the development of renewable energy, this sector is however still developing.

The ambitious plan of the European Union to meet the majority of its energy needs with energy coming from renewable sources brought about the necessity to create new legal regulations concerning the support of diversified directions in the use of renewable sources of energy. By means of implementation of many directives, the EU made every effort to create legal instruments promoting the use of renewable sources of energy. In order to attain this ambitious goal, the member states introduced various systems supporting the development of such sources. Some of these systems are based on guaranteed prices, green certificates and tenders, whilst others are based on subsidies, grants or tax exemptions.

It can be observed that in the states which primarily subsidised and co-financed, a rapid development of the renewable energy production sector was observed; e.g. a government programme in Germany supporting wind energy and the application of a system of guaranteed prices made this country become a world leader in this area in less than twenty years.

It must be stressed that reaching the 20% share of energy coming from renewable sources in the EU energy balance by 2020 will depend on the economic situation of the EU, the methods of finding their way out of the economic crisis employed by given member states, but above all on further financial support.

References

- Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources(2008), Brussels, COM(2008) 19 final version 2008/0016 (COD)
- Energy, transport and environment indicators, 2007 edition, Eurostat& European Commission, Luxembourg: Office for Official Publications of the European Communities, 2007
- EU Energy, transport and environment indicators - 2013 edition, Luxembourg: Publications Office of the European Union, 2013
- Energy Priorities for Europe, Presentation of J.M. Barroso, President of the European Commission, to the European Council of 22 May 2013
- Green Paper on a 2030 framework for climate and energy policies (13th November 2013); Obtained from: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=:2013:0169:FIN:PL:PDF>
- Green Paper on a 2030 framework for climate and energy policies (13th November 2013); Obtained from: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=:2013:0169:FIN:PL:PDF>
- Green Paper on a 2030 framework for climate and energy policies. (13th November 2013). Obtained from <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=:2013:0169:FIN:PL:PDF>
- Hiszpania nie będzie liderem w wiatrowniach, Rzeczpospolita [Polish daily] 5thFebruary2012
- Komunikat: Energia odnawialna: istotny uczestnik europejskiego rynku energii (2012)((2012) 271
- Ligus M. (2010), *Efektywność inwestycji w odnawialne źródła energii. Analiza kosztów i korzyści*, Warsaw: Wydawnictwa C e DeWu
- Meadows D. H., Meadows D.I., Randers J. Behrens W. W. (1972) *The Limits to Growth. Abstract Established by Eduard Pestel. A Report to The Club of Rome*, New York: Universe Books
- Motowidlak T., *Wpływ kryzysu finansowego strefy euro na rozwój sektora energii odnawialnej w UE*, 'Acta Universitatis Lodzianis, FOLIA OECONOMICA' 273, 2012
- National Overall Share and Targets for the Share of Energy from Renewable Sources in Gross Final Consumption of Energy in 2020. (25th September 2013). Obtained from http://ec.europa.eu/energy/renewables/targets_en.htm
- Pach-Gurgul A. (2012), *Jednolity rynek energii elektrycznej w Unii Europejskiej w kontekście bezpieczeństwa energetycznego Polski*, Warsaw: Difin
- Pyka J. (ed.)(2007), *Szanse i zagrożenia rozwoju rynku energetycznego w Europie i Polsce*, Katowice: Wydawnictwo Akademii Ekonomicznej w Katowicach
- Solar subsidies cut by more than half (2011), The Guardian, 28th October 2011
- Status of Photovoltaics in the European Union New Member States 2010, (2011)Warsaw: Warsaw University of Technology
- Energy challenges and policy, Commission contribution to the European Council

Streszczenie

ZNACZENIE PAKIETU ENERGETYCZNO-KLIMATYCZNEGO DLA ROZWOJU ENERGETYKI ODNAWIALNEJ W UNII EUROPEJSKIEJ

Wykorzystanie energii odnawialnej w Unii Europejskiej na obecnym etapie rozwoju wydaje się nieuniknione. Niesie ono za sobą liczne korzyści, w tym przede wszystkim:

- możliwość zwiększenia bezpieczeństwa energetycznego danego państwa, czy regionu na skutek dywersyfikacji dostaw energii,*
- ograniczenie importu nośników energetycznych, np. gazu ziemnego, ropy naftowej, a tym samym zmniejszenie zależności surowcowej,*
- efekty ekologiczne związane z eliminacją emisji gazów cieplarnianych i innych substancji szkodliwych dla środowiska naturalnego a także wiele korzyści ekonomiczno-społecznych, takich jak chociażby nowe miejsca pracy.*

Pakiet energetyczno- klimatyczny zobligował kraje członkowskie do spełnienia wspólnego celu jakim jest zwiększenie udziału energii z odnawialnych źródeł energii do 20% w ogólnym bilansie energetycznym UE do 2020.r Jest to zadanie niezwykle trudne gdyż sektor odnawialnych źródeł wymaga rozwoju i ogromnego wsparcia finansowego, w celu zwiększenia jego konkurencyjności w stosunku do źródeł konwencjonalnych energii. Przyjmując pakiet energetyczny przywódcy państw członkowskich nie przewidzieli kryzysu gospodarczego i jego wpływu na gospodarkę Unii Europejskiej, w tym na sektor energetyczny.

Słowa kluczowe: *pakiet energetyczno- klimatyczny, energetyka odnawialna, polityka energetyczna UE, bezpieczeństwo energetyczne, mix energetyczny, instrument wspierające rozwój OZE*