

Factors affecting the status and development of the energy sector in Poland

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This article presents the most important factors affecting the status and opportunities in the energy sector in Poland. Energetics is the basis of the national economy and determines the opportunities for economic development, which is why it is very important to provide the energy security. The most important factors for the development of energy sector are changing legislation, which is related to the increasing environmental awareness and commitments of states to reduce emission of pollutants, and increasing demand for energy - related to economic development. Polish energy market has undergone many changes, primarily consisting of deregulation and increased competitiveness in the sector. Traditional Polish energy industry is based on coal and lignite, which satisfies the demand for energy, but it contributes to substantial emissions. Due to the depletion of coal resources, obtaining renewable energy sources become increasingly important.

Key words – energy, development, renewable energy sources, coal, lignite, regulations, environmental pollution, European Union, energy security

I. Introduction

The energy sector is one of the most important sectors of the economy of each country. Providing energy security, that is lack of threat of energy shortages, is one of the most important tasks of the government. Access to energy determines economic development, and is important in all industries and in everyday life.

Investments in the energy sector must meet a number of requirements set by the law and are conditioned by various elements of the environment. The increase in ecological awareness and the need to protect the environment imposes limits on manufacturers, more and more emphasis is placed on generating energy from renewable sources.

II. State of the energy sector in Poland

Traditional energy industry in Poland is based on fossil fuels, mainly coal and lignite.

The structure of energy production in Poland is shown in Figure 1. About 90% of the produced energy is derived from burning coal or lignite. This process causes the emission of pollutants, mainly carbon dioxide.

For several years the amount of energy produced from renewable sources in Poland increases, such as biomass utilization – in 2011, 33% growth was reported in the use of energy from biomass in the energy industry (compared to the previous year).

The demand for energy in Poland is increasing, and also the scale of its production is growing.

As shown in Figure 2, the increase or decrease of production and consumption is closely related to

fluctuations of gross domestic product. During the economic crisis, the scale of production and the demand for energy has been significantly reduced. However, since 2010, along with GDP growth, the production and consumption of energy is increasing. Overall in 2011, Poland produced 163 153 GWh, which is an increase of 4% over the previous year, while energy consumption increased by 2% and amounted to 157 910 GWh.

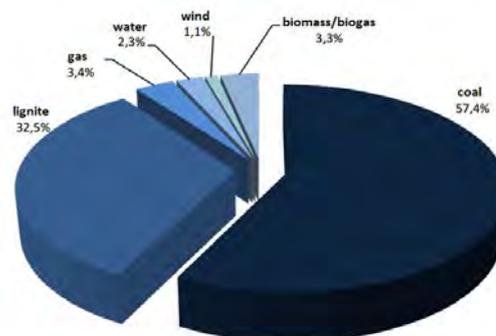


Fig. 1. The structure of energy production in Poland by type of fuel in 2010 [1]

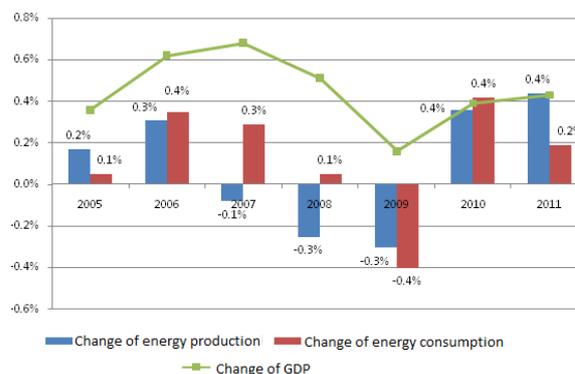


Fig. 2. Dependence of domestic production and consumption of energy and GDP in 2005-2011 [2]

On the Polish market five major electricity companies operate, these are: PAK, ENEA SA, Tauron Polska Energia SA, Energa SA and PGE Polish Energy Group SA. These companies are responsible for providing energy to separate parts of the country [3]. Since the nineties structure of sector subjected to numerous transformations, the aim is to privatize power companies, which will contribute to competitiveness growth in the industry.

III. Legal factors

Because of the crucial importance for the economy and a high impact on the environment, the energy sector subjects to many legal regulations. The legislation on energetics undergoes many changes and is very unstable.

In Poland, the sector is governed by the Energy Law of 10 April 1997 (Journal of Laws of 1997 No. 54, item. 348). This Act was amended several times, due to, inter alia, the Polish accession to the European Union.

The fact of membership in the European Union has forced changes in the energy market in Poland, its deregulation and increased competition.

So far European law in the energy sector includes three directives. The first, Directive 96/92/EC of 19 December 1996 concerning common rules for the internal market in electricity, unified operating conditions within the EU, taking care to increase the efficiency of the industry, security of supply, competitiveness growth, and reduce the negative impact on the environment [4].

In 2003 another directive was adopted, 2003/54/EC of the same name as the previous one. This act repealed Directive of 1996, introducing a number of improvements. In 2004, Poland has made amendments to the Energy Law Act to conform to EU law. The Directive was required to allow consumers to choose their electricity supplier on free-market principles, with which Poland has fulfilled in 2007.

However, this directive turned out to be insufficient, which is why in 2009 a package of Directives 2009/72/EC was announced in order to affect more effectively on energy markets in the member countries in order to improve competitiveness and environmental protection. These Directives regulate in detail the conditions for access to cross border electricity transmission and the principles of the internal energy market [5]. Directive 2009/72/EC has not yet been implemented into Polish law.

IV. Environmental factors

Traditional methods of energy production in Poland, such as the use of coal and lignite, lead to significant emissions of pollutants. The by-product of coal combustion are, inter alia, particulates, sulfur dioxide and carbon dioxide.

Besides the environmental protection, it is also important to ensure energy security of the country. Poland's coal resources are limited. Therefore, the use of renewable energy in the production process should be increased. The renewable energy sources are [6]: wind energy, solar energy, geothermal energy, energy of water, energy of biomass and biogas.

In Poland, the share of electricity from renewable sources in the total electricity produced is low, but growing, which is illustrated in Figure 3.

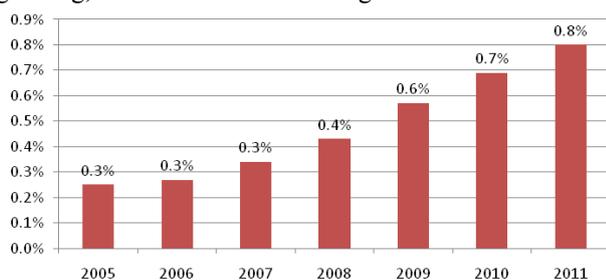


Fig. 3. The share of renewable energy in total electricity production [7]

Wind energetic is the one that develops most intensively. Most of the energy produced in this way in West Pomerania, Pomerania and Greater Poland voivodships. Wind energy now is almost 60% energy obtained from renewable sources [8].

In Poland, the largest economic potential of renewable energy resources lies in the biomass, which may be obtained inter alia from the processing of selected municipal waste. On the other hand, an enormous amount of waste is landfilled, not using their potential. After suitable treatment

waste can become a source of energy, and its use for this purpose will also reduce the amount of garbage littering that threaten the environment [9]. The use of renewable energy is in line with the recommendations of the European Union (Directive 2009/28/EC on the promotion of the use of energy from renewable sources). The development of the renewable energy sector is part of the Polish Energy Policy until 2030.

V. Trends in energy development in Poland

Traditional Polish power industry for years is based on coal. However, with the development of technology, a lot of more efficient, more affordable and less polluting ways of generating energy are created. On the other hand, the equipment used in the Polish power plants is becoming more and more obsolete, so their efficiency decreases - and the energy from alternative sources is not able to fulfill market needs and provide energy security. The investment in the area of energy production based on coal helps to increase production efficiency and reduce emissions.

The alternative is a nuclear power, but it raises a lot of controversy. However, at the current rate of implementation of the plan of development of this nuclear electricity, the first reactor in Poland can be expected only after 2020.

The rate of development of renewable energy technologies in Poland is not acceptable. Although the share of renewable energy in total production is increasing, but still it is very low - it is due to, inter alia, incoherent laws and regulations and the lack of adequate support.

Trends in the use of renewable energy sources can be seen all over the world, major corporations are investing in alternative energy generation.

It can be concluded that the growing importance of environmental factors and more emphasis on the use of renewable energy sources are more important in the development of the energy sector. It seems impossible to replace total coal-based production, but the technology used cause an increase in efficiency and reduce environmental impact.

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