Economic and social aspects of restructuring Polish coal mining: Focusing on Poland and the EU

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ABSTRACT

The current policies of both the EU and the Polish government, as far as developing a strategy of energy security is concerned, focus on searching for methods of diversification of independent energy sources. At the same time, the world faces a challenge of providing sustainable development. Eurostat data from 2013 clearly indicate that EU countries are dependent on energy and its resources are imported at a rate of up to 53.2%. However, Poland does not rate unsatisfactorily, and with a dependency level of 25.8%, is among the least dependent countries. This independence is guaranteed by black and brown coal deposits. In such a political environment, the Polish hard-coal mining industry needs to create a new policy of restructuring within the industry and to aid further development. The present article is an answer to the search for methods of forecasting mining production taking into account both the social and economic aspects of Polish mines. Therefore, this paper presents two elements of rationalisation in terms of the production efficiency of mining companies – human resources capital and the volume of black coal sales. The applied forecasting methods may help/determine the future number of employees working underground in Polish mining companies, on the basis of the proposed forecasting methods of the sale of black coal. On the basis of the presented research, the Authors wish to draw attention to the search for restructuring solutions in Polish coal mining companies, in areas other than human capital.

1. Introduction

Two types of energy are currently a sine qua non condition for world economies, including Poland. One of them is solar energy provided by nature, the other is produced energy, including electrical energy. The constant flow of electrical energy forms a basis for a stable economy. Therefore, achieving a certain level of energy security is a crucial issue. Poland, as a country in possession of its own energy resources, has one of the lowest energy dependency rates in the EU (Eurostat, 2015).

This state is ensured by deposits of black and brown coal. Therefore, in the present situation it is increasingly important to develop effective methods of forecasting the production of these resources on the basis of the internal and external factors of this sector. External factors include existing global problems, especially considering the economic conditions within the EU. Internal factors include economic and social factors both on a micro and macro-environmental scale. Taking into account these areas, the Authors propose a method of forecasting selected factors of black coal production, supporting the planning of an energy policy in Poland.

2. Black coal as an element of the energy policy in Poland and the EU

In order to demonstrate clearly the external factors affecting Poland’s energy policy, in this chapter the Authors concentrate on circumstances necessary to maintain Poland’s energy independence based on hard and brown coal. The assumptions made for the model presented in the next chapters and further conclusions result from this analysis of the economic environment including the energy policy in the EU and Poland.

Thus, the role of coal as an energy carrier is essential for energy security in the EU as the prices of primary energy carriers, especially crude oil and natural gas, remain on a high level. The consumption of primary energy in the European Union, in 2012, was at a level of 2.4 billion tonnes of standard fuel units, of which Gawlikowska-Fyk and Nowak (2014) (Fig. 1):

- 33% primary energy came from crude oil,
- 23% from natural gas,
- 17% from (black and brown) coal,
14% from nuclear energy,
11% from renewable energy sources,
1% from waste,
1% others.

As black coal is in third place among energy sources in the EU, it is
worth considering how to use it despite the environmental problems
it creates. There are studies regarding new effective combustion
technologies, new technologies of processing coal into liquid fuels, as
well as the production of ecological size-grades of high quality coal
(Frączyk, 2013; Traubman, 2013). Taking into consideration all the above
facts, coal should be perceived differently than before, i.e. not only as a
contaminating the environment and solely used for burning (Arabia
et al., 2014).

Turmoil in Ukraine made it clear to European decision-makers
exactly how important domestic energy sources are, especially when
their import is not dependent on any single body. The Eurostat data
from 2013 clearly indicate that EU countries are dependent on imports
of energy sources and energy at a rate of up to 53,2%. Compared to
other European countries, Poland does not come out poorly and with a
dependency level of 25,8% places among the least dependent countries.
The largest economies in the EU have a high degree of energy
dependency and among them are countries such as: Germany
(62,7%), France (47,9%) and Great Britain (46,4%) (Eurostat, 2015).

There are also countries which are almost entirely dependent on
imported energy resources, such as: Luxembourg (96,9%), Belgium
(77,5%), Spain (70,5%), Italy (76,9%) (Eurostat 2015). Thus, the main
goal of the European energy policy is to use its own energy resources
to the greatest extent possible. The development of renewable energy
sources have slowed down in many EU countries and one of the
reasons is the high cost as well as the instability of renewable energy
resources, which are dependent on weather conditions. It was once
believed that nuclear power stations were be a panacea for all ills, but
the events following the tsunami disaster in Japan, put this idea to rest.
This is why nuclear energy will cause many social controversies and its
development may turn out to be difficult, if not impossible (Kalisz and
Frączyk, 2012).

EU policy needs to consider the variety of resources of its member
countries. This is required in article 194 of the Treaty on the
Functioning of the European Union (Braun, 2011). However, on the
one hand, each country has the right to determine the conditions as to
how these resources are used; on the other hand they are obliged by
Article 194 to adopt a joint stand on energy issues. Therefore, member
countries are obliged to adopt the main principles of the EU energy
policy and to adapt their domestic policies to EU policy. Nevertheless,
as it was mentioned earlier, in the face of recent events in Ukraine, the
EU policy has begun to focus mainly on energy security based on its
own resources and independence from external sources, especially
crude oil and natural gas.

To ensure the EU’s independence from crude oil and natural gas
suppliers, the European Commission recommends that the EU clearly
determines the principles of a diversified energy policy based on the
principles of partnership with important international players in the
energy field. It recommends creating a pan-European Energy
Commonwealth (Green Paper, 2006; Tylec, 2013). It also means that
countries like Germany aspire to increase the percentage of renewable
energy resources in the energy equation as it will allow Germany to
reduce the import of other energy resources, thus ensuring the
country’s energy security.

The situation in Poland appears to be completely different as we
have solid-fuel resources (black and brown coal), which allow us to
ensure internal energy stability in Poland while having one of the
lowest rates of energy dependency in the EU (Eurostat, 2015). Polish
coal is threatened by the increasing cost of extraction and growing
imports of this resource into Poland in recent years – from about
1,5 mln tonnes in 2000 to 10,5 mln tonnes in 2013 (including at least
2/3 from Russia) (Table 1) (Stala-Szlugaj, 2013; Okulski, 2013; GUS,
October, 2014) (Fig. 2).

Direct consumers also need to be taken into consideration, constituting
21% of distribution in 2013 and assuming that in that particular year, exports almost equalled imports, we may conclude that they constituted about 20% of the black coal market in Poland
(Fig. 3). In 2012, as many as 7,5 mln tonnes of black coal were sold to
direct consumers in coarse and medium particle size-grades and
adding 800 thousand tonnes in coal perks the size grades constituted
over 10% of national consumption (IGSPW, 2015). Taking into account

![Fig. 1. Primary energy consumption in the EU, in 2012. Source: Gawlikowska-Fyk and Nowak (2014).](image)

![Fig. 2. The percentage of coal as an energy source in Europe from 1990 to 2013. Source: Individual study based on Jonek-Kowalska (2015).](image)

| Table 1 Distribution of black coal in Poland in 2000–2013 Source: Industry statistical yearbook, GUS (2014). |
|-------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| National consumption | 106616 | 101276 | 94753 | 89978 | 8966 |
| Processing into other energy carriers | 8489 | 70722 | 82162 | 77358 | 77610 |
| Including power stations, heat and power stations, heating stations | 63942 | 62140 | 63501 | 57925 | 58708 |
| direct consumption | 51628 | 50903 | 50475 | 46005 | 40080 |
| Gain in reserves | 20948 | 16582 | 18661 | 19433 | 18902 |
| Loss and balance differences | –1519 | 1716 | 2626 | –1289 | 1212 |
| Export | 23245 | 19369 | 9965 | 7070 | 10847 |
| Import | 1452 | 3372 | 13603 | 10165 | 10516 |
| Export/import balance | 21793 | 15997 | –3638 | –3095 | 331 |

![Table 1](image)
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