

---

## Restructuring Changes in the Energy Sector in the Context of the Green Economy

---

Submitted 01/08/23, 1st revision 11/08/23, 2nd revision 13/09/23, accepted 30/09/23

Agnieszka Budziewicz-Guźlecka<sup>1</sup>, Kamila Schneider<sup>2</sup>

**Abstract:**

**Purpose:** The purpose of this article is to present the directions of the energy market and highlight the European requirements related to the development towards a green economy.

**Design/Methodology/Approach:** The study used a critical analysis of the literature. On the other hand, in the context of restructuring, research was carried out according to discriminant models.

**Findings:** The article examines the phenomena occurring in energy markets that are currently undergoing transformation. Understanding the new processes is crucial for the smooth operation of this market.

**Practical Implications:** The research conducted indicates that the energy market will undergo changes towards a green economy.

**Originality/Value:** The article presents the results of own desk research. The issue presented has not previously been addressed in discussions published internationally.

**Keywords:** Green economy, restructuring, energy market.

**JEL codes:** . O12, O44, H54, L94.

**Paper type:** Research article.

**Research funding:** The project is financed within the framework of the program of the Minister of Science and Higher Education under the name "Regional Excellence Initiative" in the years 2019 – 2022; project number 001/RID/2018/19; the amount of financing PLN 10,684,000.00.

---

<sup>1</sup>Assoc. Prof., Institute of Spatial Management and Socio-Economic Geography, University of Szczecin, Poland, ORCID 0000 0000-0002-9403-7925, e-mail: [agnieszka.budziewicz-guzlecka@usz.edu.pl](mailto:agnieszka.budziewicz-guzlecka@usz.edu.pl);

<sup>2</sup>Centrum Rachunkowo – Skarbowe w Szczecinie

## 1. Introduction

Energy transformation has become a global phenomenon. The economy of the future should be based on green energy. The implementation of the state energy policy is in the interest of the state. State energy policy (like other sectoral policies (Budziewicz-Guźlecka, 2011; 2019; Czaplewski, 2019; Drab-Kurowska 2019) should correspond to the political, economic and social goals of the state and its citizens.

However, the form of energy regulation varies greatly depending on the form of government and regime (Budziewicz-Guźlecka and Drozd, 2022). One of the most important contemporary challenges for state policy is to set the right direction for the development of the national energy sector. The state's responsibility in this regard is fundamental, and the key document defining the principles of the sector's development is Poland's energy policy.

The current strategic document is the Energy Policy of Poland until 2040 (Energy Policy). The latest document that influences the country's energy policy is Fit for 55. The "Fit for 55" package, is the EU's largest initiative to reduce greenhouse gas emissions. The package supports greater use of renewable energy, improved energy efficiency, faster deployment of low-carbon modes of transportation (Drożdż, Rosa *et al.*, 2022) and the infrastructure and fuels that support them, as well as tools to protect and develop natural carbon sinks. The implementation of most initiatives will entail additional costs for the green transformation of the EU economy in general and the energy sector in particular.

The intrinsic feature of RES, which is the generation of electricity thanks to the inexhaustible resources of wind and sun, allows for a significant reduction in the consumption of fossil fuels in the economy and a far-reaching liberalization and democratization of power generation. In a system dominated by RES, there is virtually no justification for preferring large, state-owned entities as guarantors of the country's energy security.

## 2. Literature Review

The green economy, associated with the shift of the economy to the so-called "green track", shows one of the mainstream ways out of the environmental crisis and becomes a panacea for overcoming the global environmental crisis (Burchard-Dziubinskaya, 2014). It can be treated as an economic model that engages in sustainable and profitable development, seeking situations that generate economic, social and environmental benefits (Grudzinski, 2018; Pociovalisteanu *et al.*, 2010).

The green economy refers to activities related to: lower emissions of major air pollutants and greenhouse gases, reduction of electricity and water consumption, use of renewable energy sources on a larger scale, conscious management of forest

areas, appropriate shaping of water resources, efficient use of soil resources, analysis and evaluation of the impact of human activities on the state of the environment, increasing environmental awareness of residents and businesses.

The goal of the transformation of the energy sector is to decarbonize energy generation. This process is based on abandoning vertical, centralized energy monopolies (i.e., moving away from the model of energy generation by state-owned companies) to a decentralized electropower system, in which energy is generated from multiple RES by multiple energy market participants (Thalassinos *et al.*, 2022).

The acquisition of control of business entities through the implementation of mergers and acquisitions is a commonly occurring element of the economic environment and is increasingly chosen by companies as a tool for implementing growth strategies (Budziewicz-Guźlecka *et al.*, 2018).

Mergers and acquisitions are complex corporate processes that need to be considered multifaceted - as activities at the intersection of a company's growth strategy, financial management, or environmental, social and economic development responsibility requirements. Restructuring processes are supposed to contribute to adaptation to the requirements of the environment: economic, social, or environmental.

The reconstruction of the system of functioning of the Polish economy has forced enterprises to seek and create adaptation solutions to the conditions of a market economy, using for this purpose the existing and available capital components (material, financial and human), organizational structures and restructuring possibilities of the object, nature and scope of economic activity.

Therefore, in the current and future strategy for the transformation and development of enterprises, a special place in the process of their management should be given to the comprehensive use of past experience and practical observations made during the preparation and implementation of restructuring processes. This is because enterprises will always express a demand for changes of a restructuring nature, as they generate opportunities to restore their balance in the evolving environment and create conditions for future development.

In the literature, the general definition of restructuring can be reduced basically to two approaches, depending on whether the definition emphasizes theoretical themes (trying to bring out the essence and features of restructuring) or reflects a pragmatic approach (exposing specific areas or aspects of restructuring resulting from research and analytical needs).

According to Singh (1993), restructuring is an abrupt change in a company's assets, capital structure or organizational structure. It includes a variety of transactions that lead to the sale of parts of the company or the acquisition of

new business areas, changes in the capital structure by increasing the level of debt, changes in the ownership structure or, finally, changes in the internal organization of the company. Restructuring is a change, with the change being thorough (radical) and involving significant areas of business activity (Singh, 1993).

The guiding principle of restructuring proceedings is to avoid bankruptcy of the debtor by allowing him to restructure. A tool that can be used to predict bankruptcy is discriminatory models.

Discriminant models reduce the assessment of a company's health to the analysis of a single indicator. This indicator combines various financial indicators in a weighted manner. The value of the Z function is determined on the basis of the data contained in the financial statements.

This method allows an unambiguous assessment of the company's situation. The calculated value of the function makes it possible to sum up the entity's condition by classifying it into one of the groups - companies operating without apparent problems or companies at risk of bankruptcy (Klimczak, 2007, p. 13).

The first discriminatory model, which was created in the 1960s, in the United States, was the E. Altman model. After 1989, Polish economists turned their attention to the inadequacy of foreign models to Polish conditions, and so Polish discriminatory models were created: the Mączyńska model (Mączyńska, 2010), the Gajdka and Stosa, Poznan, Hadasik model (Hamrol, 2004).

The disadvantages of discriminatory models are their rapid obsolescence, resulting from changes in economic conditions and the use of data from past periods.

### **3. Results**

In Poland, Orlen operates in the energy market. The company was formally established in 1999 under the name Polski Koncern Naftowy - PKN and made its debut on the Warsaw Stock Exchange the same year. In April 2000, the Extraordinary General Meeting of Shareholders of the new company passed a resolution for PKN to adopt the trade name Orlen, referring to the combination of parts of the words eagle and energy.

At present, the main production plant in Plock is the largest refining and petrochemical complex in Poland, and the company itself is one of the largest entities in this industry. The Orlen Group includes companies in Poland, China, Germany and Lithuania. Units located in Poland, Germany, the Czech Republic, Lithuania, Malta, Sweden, the Netherlands, Slovakia Hungary, Estonia and Latvia, as well as the US and Canada.

In these markets, the corporation currently has a network of nearly 2,800 fuel stations. In Canada, in turn, through the entities of its subsidiary Orlen Upstream, it manages oil and gas production assets - these 2P (certain and probable) hydrocarbon reserves currently amount to 153 million boe (barrels equivalent).

PKN Orlen, through its entities, manages six refineries with a total crude oil processing capacity of 35.2 million tons per year. These include refineries in Plock, with a maximum capacity of 16.3 million tons per year, as well as in Trzebinia and Jedlicze, and in the Czech Republic - in Litvinov and Kralupy, as well as in Mažeikiai in Lithuania, the only refinery in the Baltics.

The corporation is diversifying the supply of oil to its refineries by taking over supplies from alternative destinations, such as Saudi Arabia. The company's refineries have in recent years used crude oil from Iraq, Azerbaijan, Kazakhstan, Nigeria, Venezuela, Norway and the US, among others.

The condition of PKN Orlen according to models for assessing the ability to continue operations for 2018-2020 carried out in 2022 is presented in Table 1.

**Table 1.** *Evaluation results according to discriminant models*

Model	years	Evaluation result
Model Altmana	2018	there is uncertainty of going concern
	2019	there is uncertainty of going concern
	2020	probability of bankruptcy very high
Model E. Mączyńska	2018	enterprise very good
	2019	enterprise fairly good
	2020	enterprise at risk of bankruptcy within 1 year
Według Modelu B. Pruska	2018	no danger
	2019	attention intermediate zone
	2020	at risk of bankruptcy
Model J. Gajdki i D Stosa	2018	no danger
	2019	attention intermediate zone
	2020	at risk of bankruptcy

*Source:* Own study – K. Schneider.

In 2020, the company also spent 32 billion zlotys to buy 91 percent of shares in the energy concern Energa. This was followed by a merger with Lotos. As indicated, PKN Orlen's performance was also affected by the economic crisis caused by the coronavirus pandemic.

Despite the fact that the evaluation of the results from the discombobulation models indicated a threat of bankruptcy, the government decided to bail out the company and create a multienergy concern out of the company, whose scale and scope of operations are expected to allow it to compete with other European players (Zylinski, 2021).

---

Orlen Group's long-term strategy adopts an alignment with the energy transition, namely that the company will invest in the green economy. It is planned to spend 120 billion zlotys on green investments by 2030.

The corporation has established the ORLEN VC Fund. Its task is to support companies, start-ups, research institutes and others that develop projects that have the potential to make a real impact on the energy transition. Targeting a green transformation will certainly be difficult for the company.

In addition to social and organizational issues, it is also important to implement regulations that favor the financing of green investments. Certainly, the corporation needs external financing, and the amount depends on the company's commitment to this segment.

#### **4. Discussion**

The functioning of the newly emerging energy system will not, as before, only be the result of state interference at the legal-political level, but will require broad public participation, and it is perhaps this that will condition the energy transition. A key direction will be the transition to renewable energy sources and intensification of energy conservation processes (Drab-Kurowska and Drozd 2022).

The creation of the new PKN Orlen, according to the initiators of this project, is also a response to trends related to the construction of integrated value chains that meet today's needs; a common product portfolio and greater financial capabilities will enable the implementation of large investment projects requiring multi-billion dollar investments that benefit the Polish economy, while the optimization of purchases and jointly conducted logistics operations will contribute to generating significant savings.

It is not without significance that the construction of a single, strong multienergy concern will contribute to strengthening Poland's position not only in the region, but also globally, influencing both an increase in the level of competitiveness of Polish enterprises and the provision of a higher level of energy security for the country.

Development in renewable energy sources is being introduced in Poland. Still, the pace of change will lag behind other countries, which may expose Polish consumers to the risk of expensive energy for up to 10 years longer than residents of other EU countries.

From the point of experience in the now fully liberalized telecommunications market - once with a monopoly, then an oligopoly, now in the energy market the state is acting not as an impartial regulator, but as the owner of most of the

generation, distribution and transmission assets.

In practice, this can lead to a delay in the modernization of the industry through the high decision-making inertia caused by the lack of competition and the systemically low innovation of state-controlled companies. Continuation of this model is highly likely to lead to a prolongation of high energy prices and lower Poland's energy security, translating into a decline in competitiveness (Bukowski, Kobyłka, 2022), and thus a delay in the transition towards a green economy.

## **5. Conclusions**

States should step back from the role of owner of energy assets, focusing instead on the role of an impartial regulator concerned with the efficient functioning of the energy market and stimulating the rapid modernization of the electric power industry, including achieving its full decarbonization as soon as possible.

Certainly, a responsible approach to climate change is needed in every country, taking into account the costs and effectiveness of proposed solutions. Innovations should be made to lower the cost of producing green energy to make it competitive with fossil fuels.

However, it is important to remember that they must be economically viable. Economic activities, including the energy transition, should be profitable and create new jobs. Therefore, it is important that climate policy take into account the economic aspect and strive to create conditions conducive to economic investment. According to both the requirements imposed and the desires arising from social trends, the energy market should develop in the direction of a green economy.

The construction of a multi-utility corporation could make it possible to finance the energy transition. However, the deeds of the state-controlled company are being watched with concern by consumers of the products, as a monopolist is emerging on the market.

## **References:**

- Atkisson, K., Atkisson, A. 2013. Green Economy 2013. A Strategic Briefing on the State of Play in the Global Transition. Atkisson Group's Sustainability Intelligence Unit.
- Budziejewicz-Guźlecka, A. 2011. Przekształcenia polskiego rynku usług telekomunikacyjnych In: Rynek usług telekomunikacyjnych, red. H. Babis, K. Flaga-Gieruszyńska, Warszawa.
- Budziejewicz-Guźlecka, A. 2019. Oddziaływanie polityki społeczno-gospodarczej na zmiany polskiego rynku usług telekomunikacyjnych; Wydawnictwo Naukowe Uniwersytetu Szczecińskiego. Szczecin, Polska.

- Budziewicz-Guźlecka, A., Drożdż, W. 2022. Development and implementation of the smart village concept as a challenge for the modern power industry on the example of Poland. *Energies*, 15(2), 603.
- Budziewicz-Guźlecka, A., Czaplewski, M., Drab-Kurowska, A. 2018. Integracja sektorowa wybranych europejskich rynków pocztowych i telekomunikacyjnych w warunkach globalizacji. Wydawnictwo edu-Libri.
- Buko, J., Duda, J., Makowski, A. 2021. Food production security in times of a long-term energy shortage crisis: the example of Poland. *Energies*, 14(16), 4725.
- Bukowski, M., Kobyłka, K. 2022. Nowy paradygmat Dłaczego energetyka potrzebuje konkurencji? Raport 2022. <https://wise-europa.eu/2022/07/29/raport-nowy-paradygmat-dlaczego-energetyka-potrzebuje-konkurencji/>.
- Burchard-Dziubińska, M. 2013. Zielona gospodarka jako nowy obszar zainteresowań ekonomii. IX Kongres Ekonomistów Polskich, PTE, Warszawa.
- Czaplewski, M. 2018. Tworzenie jednolitego rynku usług telekomunikacyjnych w Unii Europejskiej. *Gospodarka Narodowa. The Polish Journal of Economics*, 293(1), 159-181.
- Drab-Kurowska, A. 2019. Polityka konkurencji w obszarze rynku pocztowego Unii Europejskiej. Szczecin: Wydawnictwo Naukowe Uniwersytetu Szczecińskiego.
- Drab-Kurowska, A., Drożdż, W. 2021. Digital Postal Operator as an Important Element of the National Energy Security System. *Energies*, 15(1), 231.
- Drożdż, W., Rosa, G., Pomianowski, A. 2022. The Importance of Introducing Zero-and Low-Carbon Solutions in Urban Bus Transport. *Energies*, 15(13), 4914.
- Dyrektywa Parlamentu Europejskiego i Rady (UE) 2018/2001 z dnia 11 grudnia 2018 r. w sprawie promowania stosowania energii ze źródeł odnawialnych (Dz. Urz. L 328/82 z 21.12.2018).
- EEA. 2022. Air Quality in Europe 2022. Europejska Agencja Środowiska, Kopenhaga.
- Grudziński, A. 2018. Wybrane narzędzia usprawniające proces zazieleniania gospodarki. In: *Rynek–Społeczeństwo–Kultura*, nr. 4(30)
- Hamrol, M., Czajka, B., Piechocki, M. 2004. Upadłość przedsiębiorstwa-model analizy dyskryminacyjnej. *Przegląd Organizacji*, (6), 35-39.
- Klimczak, K.M. 2007. Risk Management Theory: A comprehensive empirical assessment.
- Mączyńska, E. 2010. Rachunkowość a wczesne ostrzeżenie przed zagrożeniami w działalności gospodarczej. Mączyńska, Z. Messner, *Zagrożenie działalności gospodarczej a prawo bilansowe*, PTE-SK w Polsce, Warszawa.
- Obwieszczenie ministra klimatu i środowiska z dnia 2 marca 2021 r. w sprawie polityki energetycznej państwa do 2040 r.; *Monitor Polski*: Warszawa, Polska, 2021; poz. 264.
- Pociovalisteanu, D.M., Thalassinou, E., Tirca, A., Filho, W.L. 2010. Trends and challenges in the energy sector of Romania in the post-accession to the European Union. *International Journal of Environmental Technology and Management*, 12(1), 3-15.
- Singh. 1993. Challenges in Researnding Corporate Resnic turig. *Journal of Management Studies*, vol. 30.
- Thalassinou, E., Kadłubek, M., Thong, L.M., Hiep, T.V., Ugurlu, E. 2022. Managerial issues regarding the role of natural gas in the transition of energy and the impact of natural gas consumption on the GDP of selected countries. *Resources*, 11(5), 42.
- Ustawa z dnia 17 lipca 2009 r. o systemie zarządzania emisjami gazów cieplarnianych i innych substancji (Dz. U. z 2022 r. poz. 673).
- Żylińska, J. 2021. Orlen przejmuje bezgotówkowo. *Dziennik Gazeta Prawna*, nr. 92.