

**SUMMARY**  
**of the doctoral dissertation written under the scientific supervision of**  
**prof. Lilli Knop entitled ‘A system for assessing the resilience of a business model to**  
**changes in business environment using a balanced scorecard’.**

The dissertation addresses the issue of the resilience of an energy company's business model and its assessment under the conditions of the transition of the energy sector. The energy transition implies a radical change in the current operating model of the sector towards a permanent change in the structure of electricity production with a decrease in the share of coal and an increase in the share of renewable energy sources in the energy mix. Its assumptions are defined by the EU and national climate change legislation. It is shaped by the current trends of decarbonisation, decentralisation of power generation, digitalisation and electrification. While it creates new conditions for energy companies to operate, it also forces them to change their business models in a way that allows them to actively participate in the transition, but also to achieve their long-term strategic goals<sup>1</sup>. A prerequisite for the success of the transition is the resilience of the business models of these companies to changes in their business environment. The importance of business model resilience and its assessment is further emphasised by the European Sustainability Reporting Standards (ESRS)<sup>2</sup>, which require companies to disclose information on the resilience of their strategy and business model. This also applies to the TAURON Capital Group (hereinafter also referred to as TAURON).

The research papers available in the literature have provided original approaches to identifying attributes, measuring and assessing resilience. However, they have not exhausted the issue of the vulnerability of business models to changes in business environment and the building of business model resilience and its assessment. A review of business practices showed that tools to assess business model resilience are also not in place in energy companies.

The identified research gaps and the author's conviction that more attention should be paid to issues related to the vulnerability of energy companies' business models to changes in their business environment formed the basis for defining the main scientific problem of the dissertation. It has been solved by developing a system for assessing the resilience of the business model of an energy company to environmental changes with the use of a balanced scorecard (BSC)<sup>3</sup>. The research objectives of the dissertation focused on the implementation of practical business solutions. In order to realise the main objective of the thesis, theoretical, cognitive, utilitarian and methodological objectives were defined and realised.

The theoretical and cognitive objectives of the study included:

- A review and critical evaluation of the literature on the concepts and typologies of business models, resilience, resilience of business models and ways of measuring business model resilience as described in social sciences.

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<sup>1</sup> Gitelman L., Kozhevnikov M. (2023), *New Business Models in the Energy Sector in the Context of Revolutionary Transformations*, Sustainability, 15, 3604.

<sup>2</sup> Komisja Europejska (2023), *Rozporządzenie Delegowane Komisji (UE) uzupełniające dyrektywę Parlamentu Europejskiego i Rady 2013/34/UE w odniesieniu do standardów sprawozdawczości w zakresie zrównoważonego rozwoju*, [www.ec.europa.eu](http://www.ec.europa.eu).

<sup>3</sup> Kaplan R.S., Norton D.P. (2006), *Strategiczna Karta Wyników*, Wydawnictwo PWN, Warszawa, 41.

- Identification of the environmental factors most influencing the business model of an energy company.
- Identification of the key components of an energy company's business model that are vulnerable to change.
- Identification of the key factors responsible for the resilience of the energy company's business model.
- Identification of the key processes, resources and skills relevant to the resilience of an energy company business model.

The methodological objectives of the study included:

- Developing a concept for using a balanced scorecard to assess the resilience of an energy company's business model.
- Developing the methodological assumptions for building a system for assessing the resilience of an energy company's business model using a balanced scorecard.

The utilitarian objectives of the dissertation included:

- Developing the principles and a process for conducting an assessment of the resilience of an energy company's business model and a process for reviewing the system for assessing the resilience of an energy company's business model.
- Formulating guidelines and practical strategic recommendations for an energy company for the future related to the design and implementation of resilient business models.

The scope of the research covered energy companies operating on the domestic and foreign energy markets. Particular attention was paid to the energy company TAURON.

The thesis adopts and proves the following thesis: a system for assessing the resilience of an energy company's business model is based on a sustainable approach to value creation. There were also six research questions formulated. The research process was designed to meet the requirements of the research design process in management and quality sciences. The process is divided into six main stages within the research and implementation sections. The dissertation consists of six chapters, an introduction and a conclusion. The dissertation begins with a discussion of the rationale and basis for undertaking the dissertation topic and research gaps, followed by a presentation of the main scientific problem of the dissertation, research objectives and questions, the thesis, and the research process and methods.

The second chapter of the dissertation summarises the results of the review and analysis of the relevant foreign and national literature and discusses concepts related to business model resilience. Results of bibliometric research using the Web of Science database are also presented. Definitions of business model, business model resilience and resilient business model are proposed. Approaches concerning the configuration of the structure of the components of the business model, the typology of business models and the aspects of value creation shaping this tool have been evaluated and addressed. An overview of the approaches to the classification of business model types is summarised and the author also proposes her own classification of business models and the key components of a business model.

The third chapter of the thesis discusses the situation in the energy sector with a particular focus on the operating conditions of companies in this sector. The analysis was carried out in

the context of the impact of factors related to business environment on the business model of an energy company and the resilience of this model. The chapter concludes with a summary of the key determinants (factors) affecting the business model of an energy company most significantly.

The fourth chapter discusses the research model used to develop a system for assessing the resilience of an energy company's business model.

The fifth chapter is devoted to characterising the energy company's business model. The chapter presents the results of a case study of the business models of selected global and domestic energy companies. It also discusses the determinants of the resilience of the elements of the energy company's business model and the elements of the business model that are sensitive to change. The chapter concludes with a presentation of the key factors responsible for the resilience of a business model identified using a multi-criteria method of hierarchical analysis of decision-making problems, the so-called AHP (Analytic Hierarchy Process)<sup>4</sup>.

Chapter six presents the developed and validated system for assessing the resilience of an energy company's business model using the BSC. It also discusses the results of the conducted resilience assessment of the TAURON business model, which was complemented by an analysis of the resilience attributes of the TAURON business model using Walker et al.'s approach to strategies for building resilient business models<sup>5</sup>. The chapter concludes with a proposal for business model resilience assessment processes and an overview of the resilience assessment system.

The seventh chapter of the dissertation covers the conclusions and recommendations for the energy company from the business model resilience assessment carried out.

The dissertation concludes with a summary of the research findings. Both the adopted research model and scheme, as well as the research tools used, allowed the partial objectives and the main objective of the thesis to be fully realised and the thesis to be proven. The developed system for assessing the resilience of business models, made it possible to measure the resilience of the TAURON business model. The analysis of the obtained results made it possible to formulate conclusions indicating the existence of business areas in the company where strong defence mechanisms have been implemented and are functioning. The analysis also showed that many of the areas or activities implemented require focused attention to strengthening or building such mechanisms. This is necessary for the full realisation of strategic intentions and challenges arising from the uncertainty of the business environment. On this basis, guidelines and recommendations have been formulated for actions aimed to enhance or maintain the resilience of the business model.

Research has confirmed the practical usefulness of the solution developed in the dissertation. It can be successfully used for the purposes of fulfilling the obligations incumbent on the energy company resulting from the requirement to perform self-assessment of the resilience of an energy company's business model. Although the business model assessment

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<sup>4</sup> Saaty T.L. (2008), *Decision making with the analytic hierarchy process*, Int. J. Services Sciences, 1(1).

<sup>5</sup> Walker B., Holling C.S., Carpenter S.R., Kinzig A. (2004), *Resilience, Adaptability and Transformability in Social-ecological Systems*, Ecology and Society, 9(2), 5.

system was prepared for TAURON, the developed solution is, in its conceptual form, a universal solution. With appropriate modifications, it can be applied to other companies, both inside and outside the energy sector.