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The modern status and prospects for further development in the Australian energy sector: transformation, external economic relations, investment climate

Abstract: The latest global trends have led to significant changes in the nature of the world's economic development. This impact has been particularly strong within the energy sector, forcing many countries to change their approaches to energy management. It is consequently relevant to consider this industry's current state worldwide. In this research, we have examined the current situation of Australia's energy sector as well as its prospects for development. In this way, the research focuses

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on assessing the country's investment climate in the sector and the potential for further changes within it. The methods used in the study include analysis, modeling, forecasting, induction and deduction. Within the research, the impact that global trends, which are currently representative of the global energy market, have had on the development of this industry in Australia are assessed. Additionally, the inner specifics of the changes within the sector are described and investigated. In particular, the Australian energy sector development strategy is briefly described and trends in renewable and conventional energy production are assessed. The authors also describe the country's prospects with regard to the current international energy market situation and the possible risks. This publication creates a new understanding in the energy sector, particularly in Australia, and its renewable and conventional components. Additionally, new data is being generated as part of the country's economic research.

Keywords: renewable energy, government policy, macroeconomics, international relations, sustainable development

Introduction

The energy sector and its dynamics have received increasing attention over the last few years (Bichler et al. 2022). There are several factors for such interest. Firstly, there are the consequences of the COVID-19 crisis, during which, significant changes were observed with regard to energy prices (Gharib et al. 2021). After the crisis and the widespread factory shutdowns, some resources, particularly oil, were in abundance, which led to reverse pricing (where producers were willing to pay extra to have goods taken out of storage) (Wheeler et al. 2020). Subsequently, with the global economic stimulus, extreme rate cuts by the Fed (Federal Reserve) and the European Central Bank (ECB), and increased public debt by the United States, the European Union (EU) and other countries to provide welfare payments to entrepreneurs and individual workers in the aftermath of the pandemic, energy prices were able to rebound (Clarida et al. 2021; Yu et al. 2022; Jackson et al. 2021). However, at the end of 2021, other important events began to unfold, affecting the global economy and the energy sector. Due to such turbulence that has been inherent in this market recently, the relevance of considering the impact on the individual countries' economies is relevant. This research focuses on reflecting these domestic changes in Australia.

There have been a significant number of academics investigating current trends in the energy industry in Australia's domestic market. For example, Fragkos et al. (2021) and Munir and Riaz (2020), have considered the future impact of current trends in the global energy sector on Australia's strategic objectives in terms of sustainable development and the reduction of carbon dioxide (CO_2) emissions into the atmosphere. It is also worth noting the work of Udemba and Alola (2022), who assessed Australia's ability to achieve the Sustainable Development Goals. The researchers showed an effective policy for reducing carbon emissions while increasing the share of renewable sources. In addition, based on the statistical models built, they showed how

individual variables, particularly the movement of foreign direct investment, will be able to affect the energy industry. Gilmore et al. (2022) also looked at Australia's potential for a transition to renewable energy, and the potential risks and prospects that they create. However, it is worth noting that they did not examine all of the recent current trends in the international energy market. Alternatively, Atholia et al. (2020) also examined the state of renewable energy development in Australia as part of their study, particularly the investment attractiveness of the industry.

The Australian energy sector may face the following risks and challenges in the future. The development of renewable energy may increase competition in the energy market. Many countries, including Australia, are setting targets to reduce the use of coal and other renewable energy sources, which may change the competitive advantage in the market (Havrysh et al. 2019). Changes in the legal environment, including changes in emissions legislation, may have a significant impact on the energy sector. The lack of stable regulation can lead to increased risks and unexpected costs for businesses. The development of renewable energy requires additional investments in grid infrastructure. An increase in the number of energy producers may lead to changes in the way electricity is produced and distributed, which may require additional costs. The transition to renewable energy may require significant costs for the installation of new technologies and infrastructure. This may lead to an increase in the costs of production.

The aim of the paper was therefore to describe the current state of the Australian energy market as well as its prospects for future development. Furthermore, it was important to assess the risks and benefits that may arise for the country as a result of such trends.

1. Materials and methods

This article uses a variety of scientific research methods, including analysis, induction, deduction, modeling, abstraction and forecasting. The authors used a considerable amount of data from statistical websites of various kinds during the study. The following can be noted: investing, which provided data on the price of oil and other resources at specific intervals (Investing Brent Oil Futures 2022; Investing Crude Oil Urals Europe 2022); TradeMap, from which data on Australia's foreign trade, including within individual resource types, were extracted (TradeMap Australia yearly… 2022; TradeMap Australia Monthly… 2022); World in Data, which provided an estimate of the country's energy consumption and CO_2 emissions (World in Data Energy Production… 2022; World in Data CO_2 emission 2022).

In addition, data from the Australian Energy Regulator (AER) on the state of the energy market in the country as of 2022 were useful (State of the energy market 2022). The research also involved some data provided by international organizations, particularly the World Bank, whose worldwide governance indicators (2023) were used to assess Australia's domestic political condition. There are six indicators in total: corruption control, government effectiveness, political stability and absence of violence/terrorism, regulation quality, rule of law and responsiveness

to public opinion, and accountability of public bodies. All these indicators are measured in the range from –2.5 to 2.5, but most commonly in the range of –2 to 2, and political stability and lack of violence/terrorism in the range –1 to 1. In order to analyse the data, the research used some simple statistical analysis techniques, such as correlation, standard deviation, covariance and regression analysis. The article also applies a systematic approach to assess the current state and future prospects of the Australian energy sector by examining interrelated processes. In addition, the authors used various statistical analysis techniques to analyse the data collected, including correlation, standard deviation, covariance and regression analysis.

The primary approach used in the study is systemic as it allows an assessment of the current state and prospects of the further development of the Australian energy sector through separate interconnected processes. In addition, the authors used a significant number of scientific research methods. Analysis can be considered as one of them, as large amounts of information, both statistical and theoretical, were processed to form the main conclusions. In addition, the historical method played an important role, making it possible to assess the way in which trends in global and domestic energy markets have changed. Also important was the induction method, which made it possible to assess the investment attractiveness of the conventional and renewable energy sectors.

The authors also used the method of deduction to find the causes in the current state of the energy sector in Australia. It is also worth mentioning the modeling method. It was used in assessing the potential impact of current short- and long-term trends in the international energy market on the Australian economy. Abstraction was used in particular in order to better assess the impact of certain external forces on the Australian economy. In addition, the forecasting method proved important, providing a more detailed description of the Australian economy's future state based on known data on its current state and trends.

2. Results

The most recent events that seriously affected the energy market structure were the COVID-19 pandemic and Russia's full-scale invasion of Ukraine (Nerlinger and Utz 2022). The causes and consequences of the first onset of the pandemic have been described in the introduction, while the latter events, namely the escalation and subsequent outbreak of war, are worth a more detailed review. The outbreak of military action led to the disruption of some supply chains through Ukraine and Russia; some international corporations decided to reduce or shut down their operations in the country (United Nations 2022). Subsequently, the global community began to implement sanctions based on varying levels of influence, the main purpose of which was to create complexity in Russia's financial situation and their ability to continue military action (Prohorovs 2022). The global economy, which was already in a precarious state due to the effects of COVID-19, was also strongly affected (Mahlstein et al. 2022). In particular, this led to

a sharp increase in energy prices, due both to Russia's actions to reduce gas supplies to Europe and to an increased demand for oil and expectations of a subsequent decline in international supply due to future supply constraints. Nevertheless, after the implementation of sanctions, prices began to fall gradually, and through market pricing, they dropped below the maximum level. An assessment of oil price movements can be seen in Figure 1.

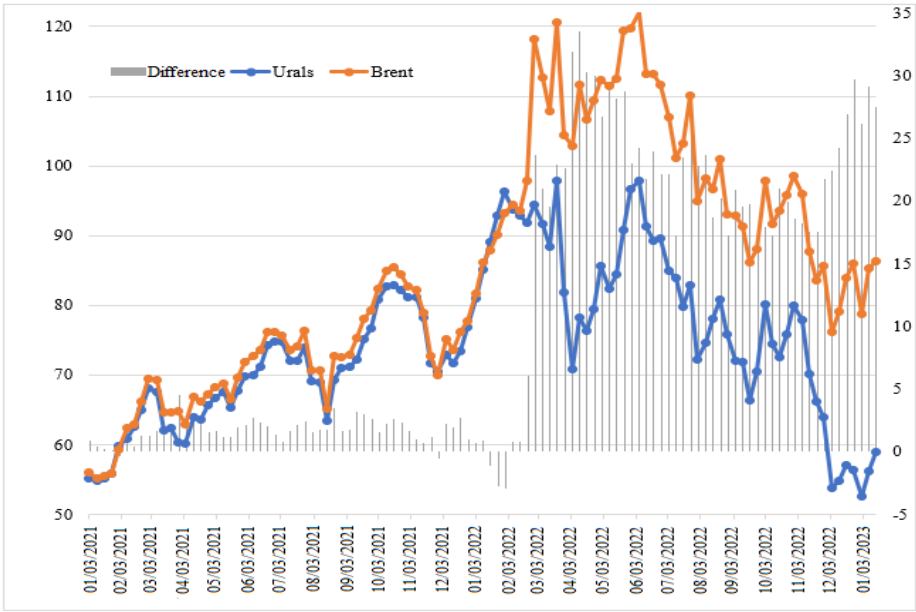

Fig. 1. Urals and Brent oil price values from January 3, 2021 to January 15, 2023 [USD]
Source: Investing Brent Oil Futures (2022), Investing Crude Oil Urals Europe (2022)

Rys. 1. Notowania cen ropy Ural i Brent od 3 stycznia 2021 do 15 stycznia 2023 [USD]

As can be seen from Figure 1, Urals and Brent prices were strongly correlated and there was no significant price variance between the two (the discounter was less than 5 USD). Nevertheless, after the full-scale invasion, there has been a significant price spike for Brent and a gradual decline for Urals: the average discount since then was 23.16 USD a barrel, or about 23% of the price. This was caused by the refusal of many major oil buyers to purchase the product from the Russian producer. This is one of the factors behind the energy crisis in Europe. This kind of change is having an unavoidable effect on Australia. The country is a large exporter of resources, including oil, to foreign markets (De Silva 2014). Thus, if we analyse the changes in the country's energy exports, we can clearly see the trend to increase in 2022. This is illustrated in Figure 2.

As can be seen from Figure 2, in 2022 there was a strong increase in Australia's oil revenues compared with 2021 (by more than 50%) with a relatively small increase in sales volumes (by 12.8%). It is also important to consider the way the situation has evolved by month. This data is shown in Figure 3.

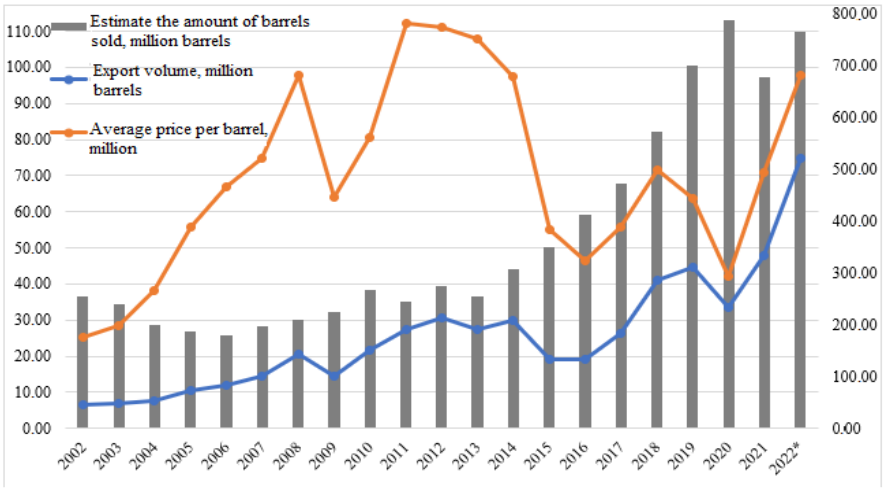

Fig. 2. Australia's petroleum product exports and average price per barrel and sales volumes from 2002 to 2022
Note: * value is estimated based on 11 months of 2022 only; the number of barrels is also estimated based on annual average price and export volumes in dollars
Source: TradeMap Australia yearly data series (2022), Investing Brent Oil Futures (2022)

Rys. 2. Eksport produktów naftowych Australii i średnia cena baryłki oraz wielkość sprzedaży w latach 2002–2022
Uwaga: * wartość jest szacowana tylko na podstawie 11 miesięcy 2022 roku; liczba baryłek jest również szacowana na podstawie średniej rocznej ceny i wielkości eksportu w dolarach

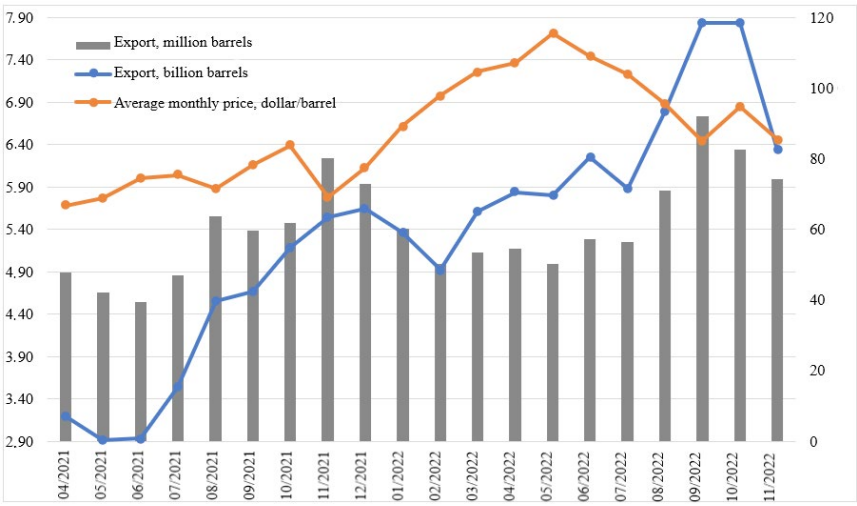

Fig. 3. Monthly Australian petroleum product export volumes from April 2021 to November 2022
Note: the number of barrels is estimated roughly based on the average annual price and export volumes in dollars
Source: TradeMap Australia monthly data series (2022), Investing Brent Oil Futures (2022)

Rys. 3. Miesięczne wielkości eksportu australijskich produktów naftowych od kwietnia 2021 do listopada 2022
Uwaga: liczba baryłek jest szacowana w przybliżeniu na podstawie średniej rocznej ceny i wielkości eksportu w dolarach

As shown in Figure 3, monthly oil export volumes in barrels and dollars are increasing due to the escalation from Russia over Ukraine. The highest quantities drop in September and October 2022 due to expectations of a Russian oil price ceiling. In general, it can be concluded from Figures 2 and 3 that the European energy crisis and Russia's full-scale invasion of Ukraine have caused an increase in the country's export revenues.

Despite the current outlook for Australia's conventional energy sector, the country is implementing a policy of 'Direct Impact' in the area of renewable and conventional energy sources. Most of the country's energy production is exported, making Australia a major supplier in Asia and Oceania. Domestically, electricity in the country is also predominantly generated from conventional energy sources, while renewable energy represents only 5–6% (Udemba and Alola 2022; Effendi and Courvisanos 2012).

It is also worth noting that the amount of energy consumed in the country is increasing rapidly every year, making the transition to renewable sources more difficult. Nevertheless, the country's carbohydrate emissions have been declining gradually, indicating the impact of the program; however, Australia still has the highest carbon intensity profile among International Energy Agency (IEA) countries. Specifically, the data on energy use can be seen in Figure 4.

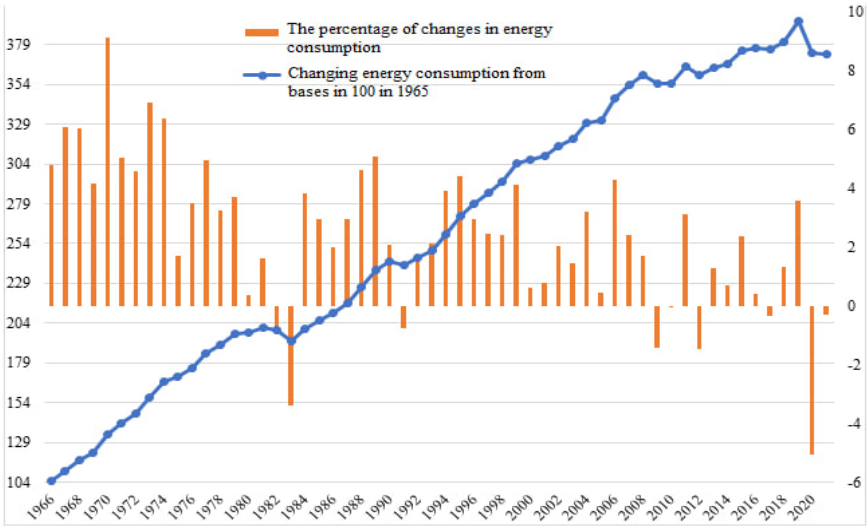

Fig. 4. Electricity consumption in Australia from 1966 to 2021
Source: World in Data Energy Production and Consumption (2022)

Rys. 4. Zużycie energii elektrycznej w Australii w latach 1966–2021

As Figure 4 shows, the energy consumption trend in the country has been strictly positive over the last fifty years. Recently, the pace may have slowed down slightly, especially in 2020, due to the onset of the COVID-19 crisis. Nevertheless, it is difficult to say yet if this decrease will prove to be sustainable or if it will lead to a new increase in consumption (Ahmed et al. 2021). Data on Australia's annual CO_2 emissions can be seen in Figure 5.

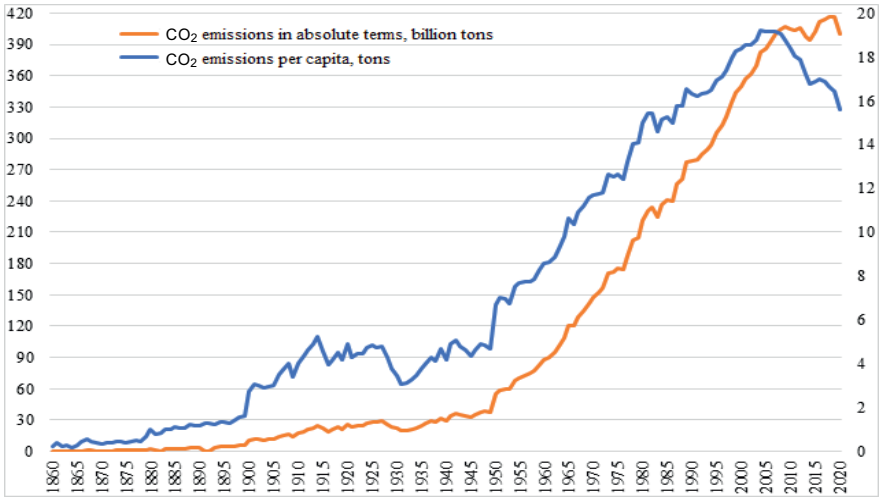

Fig. 5. Change in CO_2 emissions in Australia in 1860–2021
Source: World in Data CO_2 Emission (2022)

Rys. 5. Zmiana emisji CO_2 w Australii w latach 1860–2021

From Figure 5, it can be seen that Australia has succeeded in reducing the rate of increase in the rate of CO_2 emission. In 2004, this becomes particularly noticeable, especially in terms of per capita emissions. Until 2021, emissions were rising in absolute terms, the rate of increase, however, was not as dramatic. If this trend continues or improves (emissions in absolute terms begin to decline strongly), Australia's policies will be a success.

The country's main goal of renewable energy for the past decades is progressing fairly successfully, regardless of the small but ever-increasing amounts of green energy produced (Gilmore et al. 2022; Rabat et al. 2018). Many coal-fired power plants are already expected to be retired in the future (Atholia et al. 2020; Ali et al. 2019). For this reason, they will not be needed to develop renewable sources that can replace electricity production from this resource. Although such trends are expected closer to 2040, they may begin before then. If this is the case, the goal may be to increase wholesale electricity prices, which would increase the profitability of renewable power plants and become a driver for further proliferation and investment inflows (Kalinichenko et al. 2016).

Australia's carbon reduction policy is complex and includes a variety of measures. Achieving the targets depends on many factors, including the efficiency of renewable energy sources, reducing consumer demand for coal and other high-carbon energy sources, developing energy storage technologies, and changing the way people live (Ali et al. 2021; Niyazbekova et al. 2021b). Australia is one of the largest coal exporters in the world, making it difficult to reduce carbon emissions. In addition, the Australian government has halted the carbon reduction program introduced by the previous government, which has added to the difficulty of achieving the goals. Furthermore, foreign direct investment can play an important role in achieving Australia's sustainable development goals, including reducing carbon emissions and increasing the use of

renewable energy. Investments can provide financial resources and new technologies needed to develop renewable energy sources and reduce the use of coal and other high-carbon energy sources.

Australia is one of the countries with high renewable energy potential, particularly in the areas of solar energy, wind energy and hydropower. In addition, the Australian government has set targets to increase the use of renewable energy sources to 50% by 2030, which may attract investors to the sector. However, compared to other countries, such as Germany, China, and India, Australia remains far behind in the development of renewable energy. For example, in 2020, Australia had the lowest share of renewables in the energy mix among developed countries – less than 10% compared to Germany (43%), China (29%), and India (18%). Additionally, some investors may be concerned about the lack of stability in the regulatory framework and changes in political positions on energy, which may lead to high risks and uncertainty for investors.

Another part of the Australian government's policy is to support long-term investment in green energy. The main goal of this is to ensure that 40% of the country's energy production is from green sources. However, current efforts by the government may not be sufficient to achieve this on schedule (Atholia et al. 2020). In addition, the production, storage and transport of energy generated from renewable resources remain a challenge. All these factors demonstrate that government attention to the problems of the sector should be increased.

While the goal of zero emissions is important, for the moment, the world's energy consumption patterns still focus on traditional sources. This is shown in the data provided in Figure 6.

As can be seen from Figure 6, the ratio of renewable sources versus all others in the world is gradually decreasing. However, since 2007, this value has gradually increased from 15.22% (minimum) to 18.92% (2021 value). If nuclear power, as a source of green electricity generation, would be similar, rising from 20.29% in 2007 to 22.9% in 2021. This suggests that the world increasingly tends to rely on renewable energy, but that conventional sources remain dominant in supplying most of the world's energy production (Niyazbekova et al. 2022; Smagulova et al. 2023).

In assessing the investment climate of a country or industry, it is necessary to evaluate not only its economic indicators, such as profitability, and payback period, but also the overall political condition, business and investment barriers to starting a business, and others. The current political situation in the country can be described as stable (Martin et al. 2022). In addition, Australia is the only country on the continent and is distant enough from other countries that the occurrence of any conflicts is low. In looking at the way international organizations assess a country's domestic political situation, one can use the Worldwide Governance Indicators (2023) calculated by the World Bank. As an example, Australia scores reasonably well in all six indices, as can be seen in Table 1.

From Table 1, we can see that most indicators are at levels quite close to the upper limit (2.5), indicating that the government is actively performing its functions and, just as importantly, is following basic laws and that the domestic political situation is relatively stable. However, this is not the only index for assessing the investment climate. The World Bank Ease of Doing Business rankings (2023) are also important. According to this, Australia is ranked fourteenth among all

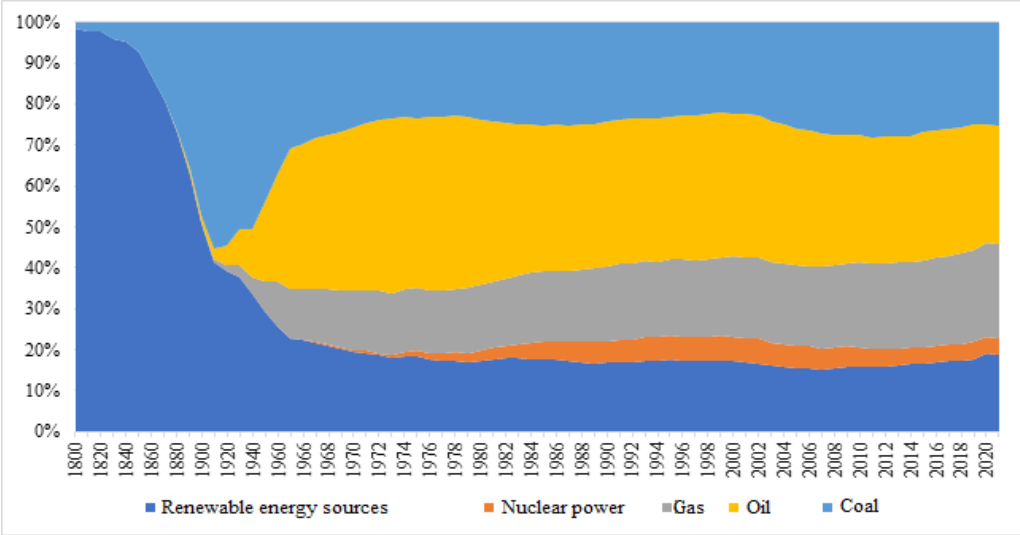

Fig. 6. Ratio of renewable to conventional energy consumption in 1800–2021 [%]
Note: for the purposes of this Figure, renewable energy has been defined as energy generated from solar, wind and hydro power, as well as from biofuels, traditional biomass (wood and agricultural by-products), and other types of renewable energy sources
Source: World in Data Energy Production and Consumption (2022)

Rys. 6. Stosunek zużycia energii odnawialnej do konwencjonalnej w latach 1800–2021 [%]
Uwaga: na potrzeby niniejszego rysunku energia odnawialna została zdefiniowana jako energia wytwarzana z energii słonecznej, wiatrowej i wodnej, a także z biopaliw, tradycyjnej biomasy (drewno i produkty uboczne rolnictwa) oraz innych rodzajów odnawialnych źródeł energii

Table 1. Some Worldwide Governance Indicators for Australia

Tabela 1. Niektóre ogólnoświatowe wskaźniki zarządzania dla Australii

Year	2005	2010	2015	2019	2020	2021
Controlling corruption	1.94	2.02	1.88	1.82	1.66	1.74
Government efficiency	1.75	1.76	1.56	1.56	1.61	1.51
Political stability and absence of violence/terrorism	0.89	0.89	0.88	0.91	0.85	0.85
Quality of regulation	1.60	1.70	1.78	1.87	1.82	1.84
Law supremacy and public opinion	1.71	1.76	1.82	1.73	1.64	1.67
Accountability of state authorities	1.51	1.42	1.36	1.27	1.30	1.38

Source: Worldwide Governance Indicators (2023).

countries as of 2019, representing a very good result when compared with other countries. According to the index, the main benefits of starting a business in the country are the ease of starting a business (completing paperwork, all sorts of legal components) and getting credit.

Australian policy is generally geared towards attracting foreign direct investment (FDI). A major source is the United States, with which a free trade agreement has been in place since 2005. In recent years, however, some national security-related changes to foreign investment rules have been introduced. For example, the classes of FDI that require additional screening have been expanded (Foreign Investment Reform… 2020). Despite this, the non-acceptance rate of foreign investment remains low. Additionally, the Australian government has recently increased anti-avoidance legislation targeting multinational corporations operating in multiple tax jurisdictions (Investment Climate Statement 2022). Many multinational corporations may find it more difficult to operate in-house. However, this change remains to be seen in the investment climate of the country and is worth considering for potential investors (especially international investors) willing to start a business in the country.

As a result of the above, in terms of institutional development, Australia's investment climate is quite attractive for investment. The economic characteristics, on the other hand, are still significant. Admittedly, it is a large export of resources, including energy resources, that has made Australia a highly developed country (Ville and Wicken 2013). Consequently, despite the high role of renewable resource development around the world remaining a very important component for overall world prosperity, the country's national security is threatened in some way. Furthermore, the long-term inefficiencies (over 20 years) of investing in projects related to the development of these kinds of resources can also be seen. Although in tangible terms, in cannot be said that there will be a complete cessation of such energy use by the countries, the likely decline in demand is rather risky. Meanwhile, the lower supply from exporting countries may not be enough to secure their previous level of income. On the other hand, such an investment does not necessarily mean that it will not be worthwhile in the short or medium term. The authors, however, see the relevance of long-term investment in renewable energy sources. This is due to both government policies aimed at developing these types of sources and increasing government funding for them, as well as a gradual increase in the rate of return due to the high cost of conventional sources (State of the energy market 2022). In the past, the short- and medium-term outlook for green energy was not expected to be positive (Atholia et al. 2020). However, following changes in the international energy market (and sudden increases in domestic electricity prices), investing in renewable energy has become more attractive on a multi-year time horizon. Altogether, this also suggests that investment in both conventional and renewable energy is rational.

3. Discussion

Modern trends in the global energy sector have been examined by Lode et al. (2022). The most important factors for developing the energy sector in terms of renewable energy in different parts of the world, as they note, have most often been institutional. This means the creation of a supportive institutional environment, including laws, policies, regulations, and administrative

support to market players. However, the level of interpersonal relations (i.e. the views of individuals on sustainability issues), socio-cultural factors (the values that predominate in society) and geographical and historical factors are also important. The factors of interpersonal relations have received special attention from Cheng and Lee (2022). On the basis of a sociological study, they conclude that internal socio-psychological variables are positively correlated with government actions related to the energy transition to green energy. Moreover, they showed that individual qualities were found to be more influential than socioeconomic qualities. At this point, private citizens' opinions about energy sector changes are rarely taken into account by public authorities when shaping their policies. In turn, paying more attention to it, by educating the masses more about the role of sustainable development, could significantly increase the efficiency of most states in the renewable energy transition (Niyazbekova et al. 2021a).

In the case of renewable energy, emission reductions in the country have been investigated by Fragkos et al. (2021). They showed that the development of renewable energy, along with some other actions (notably the electrification of energy services and energy efficiency) are important components on the path to low emissions in 2050 in a number of countries (including Australia) to reduce CO_2 emissions to the outside environment. In addition, the research shows that resources, technological advances, and skilled labor are important factors affecting a country's ability to make such a transition. In particular, nuclear power, carbon capture and storage, and the development of different biofuels are important (Goncharuk et al. 2018). In turn, Munir and Riaz (2020) studied the short- and long-term consequences that may arise in cases where the consumption of energy from traditional forms, namely oil, gas, coal, etc., increases. The researchers based their study on data from Australia, China, and the US. They conclude for all the countries in general that the increased use of such resources leads to negative environmental consequences, making it unacceptable to expand their use in order to achieve sustainable development goals. That is a further confirmation of the idea previously mentioned in the work that investing in this industry is probably inefficient in the long term.

It is worth noting the work of Udemba and Alola (2022), in their study, they attempted to understand Australia's ability to make the transition to renewable energy sources. They demonstrated that the country's energy policy can make a major contribution to achieving Australia's climate target by 2030. However, they offer a few more tips to increase the effectiveness of achieving sustainable development. Firstly, to pay even more attention to renewable energy development. Secondly, to partially privatize the sector and encourage private investors to invest in it. Thirdly, to ensure the use of the latest technologies in the sector to accompany the development of these technologies. We should note that the authors do not fully agree with the opinion of the researchers about the existing need for privatization since public administration is better able to cope with the issues caused by the crisis realities. In addition, researchers point to the possibility of environmental degradation in the country, which is related to the possible entry of new investment in the traditional energy producing industry, which is related to the prospects for its future development in Australia. This is true, especially with the changes that have characterized the oil price environment around the world in recent times. Although such activities have a positive effect on economic development, scientists believe that economic and ecological well

-being can be achieved in trade-offs. The authorities, represented by regulators, have to facilitate the ability to find a balance between these two spheres of interest.

Gilmore et al. (2022) have also investigated the prospects for future green energy development in Australia. They indicate that Australia is currently approaching zero-emission policies quite effectively, though with challenges. The challenges of the transition to renewables and the resource specialization of the country appear in the future, according to their research. Their conclusions are generally worth agreeing with, although they ignore trends in energy markets due to the war between Russia and Ukraine in the context of their research. The conflict has not only led to higher prices for most energy resources but has also been one of the reasons for an increased shift to renewables, at least by European countries. Australia's energy strategy in today's competitive environment has been studied by Vivoda (2022). As part of his research, he assessed the possibilities of such aspects as minimising domestic risks and government capabilities. He demonstrated that Australia has many strengths and opportunities as a reliable and stable energy supplier, endowed with traditional and renewable energy resources as well as important minerals. However, the researcher also highlights factors that negatively affect the industry's development, in particular the low level of government intervention. According to the author, such a policy of minimal influence has led to a domestic energy affordability crisis, although this statement is rather controversial, since energy sector issues are currently widespread in many countries.

Australia's investment climate in general was examined by Gretton (2022). The researcher writes about potential upcoming shocks that might adversely affect the country's economic development and cause government authorities to take measures that might limit capital inflows and undermine the willingness of companies to invest. In fact, on account of the COVID-19 crisis and the rising cost of capital, countries around the world have begun to experience a deterioration in their investment climates, including Australia. However, Australia's investment appeal is still relatively high, especially when compared to other countries. In addition, the latest international market developments have generally had a positive effect on the Australian energy sector, which has only improved its investment climate. In turn, Atholia et al. (2020) in their research work, investigated the attractiveness of renewable energy in Australia. While investment activity in the industry may decline from time to time, they note that it is generally attractive with regard to investment, at least over the long term. The issue of connecting stations to the electricity grid is one of the biggest challenges for the sector. Nevertheless, in terms of investment attractiveness in the sector, the electricity price has been on a downward trend in the past, but in 2022, it is quite high in Australia. As a result, investing in this sector is not only attractive in the long term but also in the short term.

The Australian energy sector therefore has significant opportunities for development, in both 'green' and conventional energy sources. Nevertheless, the current crisis conditions in the world are causing serious issues in the sector that require greater government intervention, at least until all external sources of risk are eliminated.

Conclusions

In summary, this work has briefly analyzed the current oil market conditions. Significant price and supply fluctuations have been shown to have occurred recently. This has been primarily driven by Russia's full-scale invasion of Ukraine, which has led to higher energy prices, lower demand for Russian oil, and the formation of a discount. The energy industry in Australia has been ambiguously affected by these trends: on the one hand, it has increased energy exports and the price of electricity (which is also positive for the development of renewables) and on the other hand, it has resulted in higher energy costs for households and therefore lower demand for other products and a lower standard of living in general.

The country's main long-term goal in the energy sector is to increase renewable sources as a share of total electricity production. This work has shown that recent trends are generally positive. Several factors have contributed to this, including a reduction in per capita CO_2 emissions, an increase in the country's absolute carbon dioxide emissions growth rate and an increase in this source share. However, there remain many challenges associated with the subsequent implementation of this technology in Australia, in particular, the difficulty of producing, storing and transporting energy. There are also difficulties for most people due to rising electricity prices. Nevertheless, it is possible to overcome them by increasing the state's role in regulating the energy sector. Regarding the investment climate, the energy sector remains quite attractive for future investments. Investments in renewable sources are more suitable in the long term, whereas, in the short term, conventional sources are more appropriate. Prospectives for further research are to consider the development status of other important Australian industries, for example mining, ferrous and non-ferrous metals and chemicals. In addition, finding new opportunities to increase the investment attractiveness of the country's energy sector remains important.

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Stan obecny i perspektywy dalszego rozwoju australijskiego sektora energetycznego: transformacja, zewnętrzne relacje gospodarcze, klimat inwestycyjny

Streszczenie

Ostatnie globalne trendy doprowadziły do znaczących zmian w charakterze rozwoju gospodarczego świata. Wpływ ten był szczególnie silny w sektorze energetycznym, zmuszając wiele krajów do zmiany podejścia do zarządzania energią. W związku z tym istotne jest rozważenie obecnego stanu tej branży na całym świecie. W niniejszym artykule przeanalizowano obecną sytuację sektora energetycznego Australii, a także jego perspektywy rozwoju. W ten sposób badania koncentrują się na ocenie klimatu inwestycyjnego w tym sektorze i potencjale dalszych zmian. Metody wykorzystane w badaniu to analiza, modelowanie, prognozowanie, indukcja, dedukcja i inne. W ramach badania oceniono wpływ globalnych trendów, które są obecnie reprezentatywne dla światowego rynku energii, na rozwój tej branży w Australii. Dodatkowo opisano i zbadano wewnętrzną specyfikę zmian w sektorze. W szczególności krótko opisano strategię rozwoju australijskiego sektora energetycznego oraz oceniono trendy w produkcji energii odnawialnej i konwencjonalnej. Autorzy przedstawili również perspektywy kraju w odniesieniu do obecnej sytuacji na międzynarodowym rynku energii i możliwych zagrożeń. Publikacja ta tworzy nową wiedzę na temat sektora energetycznego, w szczególności w Australii, oraz jego odnawialnych i konwencjonalnych komponentów. Ponadto tworzone są nowe dane w ramach badań ekonomicznych kraju.

Słowa kluczowe: energia odnawialna, polityka rządu, makroekonomia, stosunki międzynarodowe, zrównoważony rozwój